NETWORK WORLD

The Newsweekly of User Networking Strategies

Volume 8, Number 37 | An International Data Group Publication | September 16, 1991

Gandalf airs high-capacity T-1 mux line

By Barton Crockett
Senior Editor

CHERRY HILL, N.J. — Gandalf Systems Corp. last week announced its next generation T-1 multiplexer line, the high-end of which boasts a 1G bit/sec bus and will support, by early next year, cell relay switching, frame relay services and local-area network routing.

Analysts said if Gandalf can deliver on its plans to integrate these capabilities into the new Infotron 2000 multiplexer, the company will have a six- to 12-month jump on competitors.

"It's really hot," said Jeremy Frank, a vice-president at Gartner Group, Inc., a market research and consulting firm in Stamford, Conn. "It's a technically elegant platform, and it will be a little better than their competitors' [products]."

Gandalf, which has about 4% of the domestic multiplexer market, was formed earlier this year when Gandalf Technologies, Inc., in Nepean, Ontario, purchased Infotron Systems Corp.

The high-end Infotron 2000 multiplexer will supersede the NX4600, which had been Infotron's flagship T-1 multiplexer and only supports time-division

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PHOTO ©1991 ALVIS UPITIS

State telecommunications managers are being pressured to provide more services in spite of budget cuts. See story, page 2.

HP, IBM among winners in OSF management plan

By Paul Desmond
Senior Editor

BOSTON — The Open Software Foundation, Inc. (OSF) is expected to announce here this week it has selected technology from Banyan Systems, Inc., Groupe Bull SA, Hewlett-Packard Co., IBM and Tivoli Systems, Inc. as the basis for its Distributed Management Environment (DME).

The announcement will be the culmination of a technology search the OSF began in July 1990 for the "best of class" network and systems management tools. The DME promises to provide a common management platform that will support network and systems management applications from numerous vendors.

Notably absent from the winners' list, which was confirmed by sources familiar with the announcement, is Digital Equipment Corp. DEC submitted its DEC Management Control Center (DECmcc) Director technology as a core platform for the DME.

Tony Viola, marketing manager for network management software products at DEC, declined to confirm before the announcement that his company's DECmcc Director technology was not cho-

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IBM product blitz widens net horizons

Company bolsters distributed data base, network management, client/server with broad introduction.

By Paul Desmond
Senior Editor

NEW YORK — As part of a sweeping announcement of more than 100 offerings, IBM last week detailed plans to enhance its OS/2-based NetView graphical user interface (GUI) to support non-SNA elements and to offer its first NetView object-oriented data management tool.

IBM client/server and CallPath announcements. See stories, pages 4 and 7.

IBM also announced a new systems management tool for local-area network-attached workstations, dubbed IBM LAN Management Utilities/2 (LMU/2), which enables users to garner information such as the operating system configuration and memory utilization of LAN workstations.

The network announcements made here were part of a fusillade of product introductions from nearly every IBM line of business, including Enterprise Systems, which unveiled seven new System/390 mainframes.

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By Joanne Cummings
Staff Writer

NEW YORK — IBM last week announced its Information Warehouse framework, a blueprint outlining how IBM will provide users with access to data on multiple platforms across an enterprise network.

Similar to IBM's Systems Application Architecture (SAA), which laid out IBM's plan for applications interoperability, the Information Warehouse frame-

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PHOTO ©1991 CAROL HALEBIAN

Anthony Acampora

Columbia U. researches gigabit net

By Wayne Eckerson
Senior Editor

NEW YORK — Researchers at Columbia University are developing a prototype optical network using technology that may ultimately make it possible to build networks capable of supporting 1G bit/sec transmission speeds among hundreds of thousands of nodes.

New broadband optical transmission technologies employed in the prototype network, dubbed TeraNet, might even be used in the National Research and Education Network, a proposed nation-

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NETLINE

NEWSPAPER

FEATURE

Groupware: a spectrum of productivity boosters

By Daniel Briere
Contributing Editor

In an industry rife with ambiguous terms, "groupware" has become one of the most cloudy. Every vendor and developer, it seems, has tried to manipulate the term to its own advantage.

The first groupware products were versions of standalone applications designed to run on networks. Users quickly learned that these were not really groupware applications at all. In fact, they became rather jaded about the term groupware and began to distrust vendor claims.

The most accepted definition of groupware today describes an application that allows groups of individuals to work on common projects in a shared environment.

Products that fit this definition range from simple electronic mail packages, which enable users to send, store and forward messages and documents (mostly text documents, although some E-mail products now allow the attachment of im-

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Motorola Codex enhances its 9800 NMS with SNMP

Net management system gets faster hardware platform and LAN management capabilities.

By Maureen Molloy
Staff Writer

MANSFIELD, Mass. — Motorola Codex last week introduced several new features, including SNMP support, for the Codex 9800 Series Network Management System (NMS), which enables users to manage local- and wide-area networks from a single NMS workstation.

The company unveiled a so-called Simple Network Management Protocol processor that enables the 9800 NMS to manage SNMP-compliant LAN devices such as bridges, routers, intelligent wiring hubs and media access units.

Until now, the product has been used to manage Codex's wide-area equipment, such as modems, data service unit/channel service units, as well as statistical and T-1 multiplexers.

In addition, Release 4 of the 9800 NMS runs on a Hewlett-Packard Co. Apollo 9000 workstation, rather than the Domain 3500 Series workstation used with previous versions. The added processing power of the Apollo 9000 will enable the system to process more events, support larger nets and offer improved response time for network management applications.

Migration of Release 4 to the HP Apollo 9000 promises a four-

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State telecom execs stretch nets due to budget cuts

Net execs expand services, delay new projects.

By Bob Brown
Senior Editor

MINNEAPOLIS — With budget axes falling on government programs, state telecommunications directors from across the country last week said they are being pressured to cut costs and leverage existing network resources to provide more services.

While a few states are actually moving forward with new statewide network projects, others are struggling to upgrade existing nets with new technologies and expand their scope, according to attendees at the National Association of State Telecommunications Directors (NASTD) 14th Annual Conference here.

One sign that austerity measures abound is that representatives from fewer than 40 states gathered at the NASTD meet, as travel restrictions caused by cost cutting kept others at home.

"Now is not the time to make requests for dollars to fund network projects based on soft dollar returns," said Peter LaVenia, director of telecommunications management for Delaware's Office of the Budget. "It isn't easy, but we're focusing on keeping costs down and expanding services at the same time."

LaVenia said Delaware's network administrators first started feeling the budget pinch about a

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US Sprint to up global focus with new services and nets

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — US Sprint Communications Co. last week outlined plans here to step up its international presence, which could involve a bid to become the third domestic carrier in the U.K. and a deal to install a fiber-optic trans-European network.

US Sprint will expand its international offerings in order to keep up with customers, according to Andrew Burroughs, vice-president of global marketing at US Sprint. "Customers are moving offshore, and we need to move with them," he said.

The decision to redouble its focus on international services also stems from the fact that the domestic market is becoming saturated while foreign markets are opening up, making it possible for U.S. firms to deliver services that were previously prohibited, Burroughs said.

Although US Sprint already offers domestic companies a number of international services, the carrier will focus more heavily on providing multilateral services in conjunction with foreign carriers and domestic services within oth-

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Briefs

Vendors form consortium. A group of network equipment suppliers last week formed a consortium that will test for interoperability among different vendors' Simple Network Management Protocol net management systems and agents.

Cabletron Systems, Inc., SynOptics Communications, Inc. and Wellfleet Communications, Inc. were among the companies represented at the first meeting of the Network Management Consortium. The group, which expects to conduct its first test early in 1992, will operate as part of the University of New Hampshire's Interoperability Lab in Durham, which already tests 10Base-T and Fiber Distributed Data Interface products.

Parallan to address low end. Parallan Computer, Inc. is expected to introduce this week a line of low-end superservers to complement its existing Server 290 family. Products in the 290 line of local-area network superservers range in price from $50,000 to more than $400,000.

The new line is expected to be on par with recently announced low-end products from competitor NetFrame Systems, Inc., with prices starting in the mid $20,000s.

Network General adds to Sniffer. Network General Corp. later this month is expected to release the next generation of its Sniffer local-area network analyzer that will be based on an expert system. The new Sniffer will not only be able to detect network problems, but will also provide information on how to fix them. The Sniffer will be based on a real-time, object-oriented data base.

Cisco to enhance WAN capabilities. Cisco Systems, Inc. is expected to unveil next week an interface for its Advanced Gateway Server (AGS)+ router, which will support 45M bit/sec T-3 transmission speeds, according to analysts.

The company is also expected to announce support for a number of other wide-area network services as well as improvements to the cBus architecture of the AGS+ that will increase throughput rates from 20K to 45K packet/sec.

Timeplex to build FDDI campus net. Ferris State College in Big Rapids, Mich., signed an agreement with Timeplex, Inc. last week to build a 100M bit/sec Fiber Distributed Data Interface campus backbone to connect multiple token-ring local-area networks.

The backbone will support more than 5,000 students, faculty and administrators in 23 buildings throughout the university. The FDDI net, scheduled for installation early this fall, will replace the current copper-based 4M bit/sec token-ring backbone currently used to link 12 buildings.

Northern casts off the wires. Northern Telecom, Inc. last week said it will demonstrate its first wireless business telephone system at Telecom '91 in Geneva next month. The unnamed wireless system will be the first product in a new line of personal communications systems that Northern Telecom plans to introduce in the U.K. and Hong Kong next year and in the U.S. during 1993.

Global mobile phone plans aired. The International Maritime Satellite Organizaiton (INMARSAT) last week said it is planning to introduce a global, satellite-based mobile telephone service by the end of the decade that would compete with Iridium, the service that Motorola, Inc. is planning to deploy by the late 1990s.

INMARSAT, based in London, said it has not decided how its service will be supported but did say it will cost less than $1 a minute and be accessible from handsets priced less than $1,000. INMARSAT currently operates a global satellite system that provides mobile communications to ships, trucks and other users.

AT&T to offer Canadian service. AT&T last week announced plans to offer its first satellite-based private network service to Canada. The carrier said it plans to offer the service via a shared hub earth station in Milwaukee that will be cut over in the first quarter of 1992. The hub will support satellite-based international private-line or very small aperture terminal services into Canada. AT&T has not yet filed tariffs for the service and declined to say when it will be available. The satellite-based private lines should be less expensive than terrestrial services in remote areas of that country, according to carrier officials.

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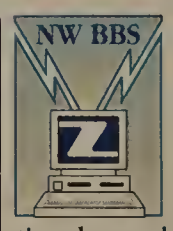

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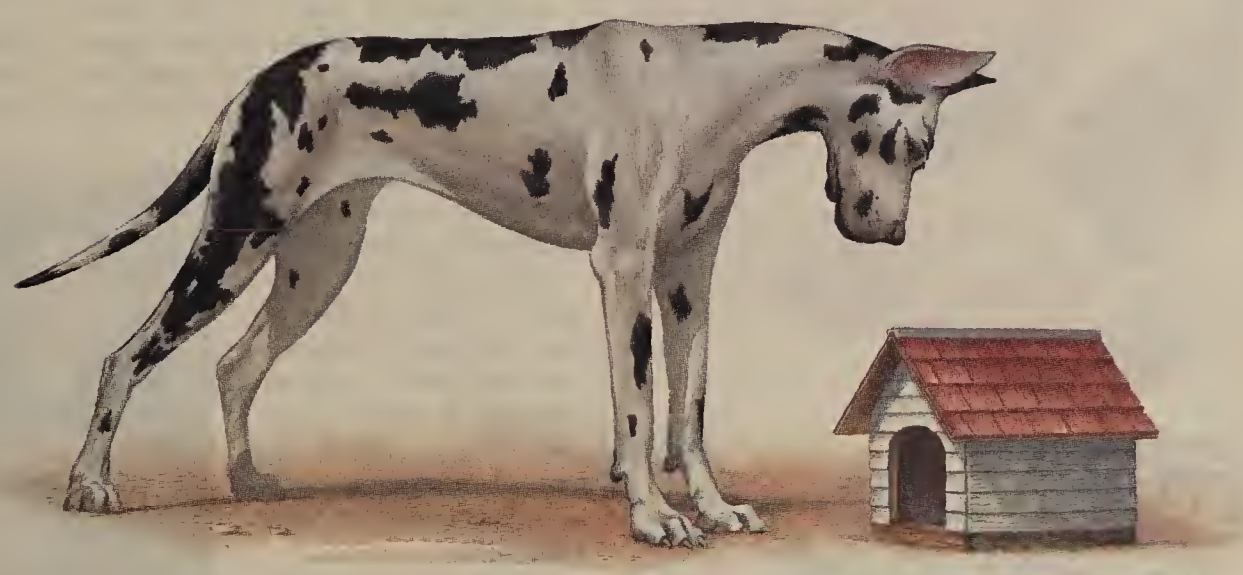

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IBM unveils bevy of client/server net components

By Paul Desmond
Senior Editor

NEW YORK — As part of the product deluge IBM unleashed last week, the company rolled out software that lets mainframes trade data with Novell, Inc. NetWare local-area networks.

IBM also enhanced support for the Transmission Control Protocol/Internet Protocol on DOS and OS/2 workstations and offered a more detailed description of its plans to support the Open Software Foundation's (OSF) Distributed Computing Environment (DCE).

"The overriding thing in this announcement was that IBM is taking an aggressive stance in terms of client/server computing," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C. "IBM is saying the shift is away from the mainframe" and calling for distribution of power into the network.

Part of that effort requires IBM to simplify LAN access to mainframe resources.

Toward this end, IBM announced LAN Resource Extension and Services (LANRES)/MVS, a software product that lets an MVS mainframe provide disk services and data distribution for multiple channel-attached NetWare V3.11 servers. It also lets NetWare clients access MVS resources in native mode and allows mainframe direct-access storage devices to be shared by NetWare servers and clients.

LANRES/MVS is an MVS version of the LANRES/VM product that IBM already offers on a request-for-price-quotation basis.

The MVS product lets customers use the mainframe to relieve storage constraints on NetWare servers and the security features inherent in MVS.

"The primary focus is on emphasizing the use of the mainframe storage architecture as a backup facility for Novell servers," said Rick Villars, director of networking architectures at International Data Corp., a research company in Framingham, Mass.

The existing LANRES/VM, which IBM last week said is now a full-fledged commercial product, supports the same functions as the MVS version. Plus, it can be used to centrally administer NetWare user identifications, priorities and access to resources using VM administration tools. It also requires servers to be channel-attached.

"You get user configuration capabilities, disk access, file and print access," Villars said. "It's very much like a full-service

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Despite Senate's endorsement, NREN still has long road ahead

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — Sen. Albert Gore's (D-Tenn.) efforts to pass legislation to create a national high-speed network moved a step forward this week with Senate passage of his bill, the High-Performance Computing Act of 1991, but obstacles remain.

Sen. Albert Gore

The bill, S. 272, provides for the creation of the National Research and Education Network (NREN), a gigabit-speed network to be built on the base of the National Science Foundation Network (NSFNET).

But the House, Senate and White House have differing views about what role the government should play in the creation of the network, and lawmakers must now try to come up with a common bill that the two legislative bodies and the Bush administration can support.

Gore, however, viewed Senate passage of the bill as an important step forward. "With the passage of this measure, the nation is prepared to put forward an information superhighway," he said.

Gore acknowledged that President Bush opposes much of his bill but expressed confidence that the president will ultimately approve it. A key point of dispute between Congress and the Bush administration is the question of how far the federal government should go in funding an advanced, nationwide net.

Gore's bill provides about $2 billion over five years to a number of federal agencies to develop new supercomputers, advanced software and the NREN itself, which is targeted for 1996 deployment. These efforts, dubbed the High-Performance Computing Program, would be coordinated and planned by the White House Office of Science and Technology Policy.

The key agencies involved in deploying NREN would include the NSF, Department of Energy, National Aeronautics and Space

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MCI outlines its plans for frame relay rollout

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — MCI Communications Corp. last week said its previously announced frame relay service will be provided through a new switch from Siemens Stromberg-Carlson and routers from Wellfleet Communications, Inc.

MCI announced in June that it would deploy cell relay-based devices in the network to provide advanced digital services and that frame relay would be the first offering it rolls out. At that time, the carrier said it had not decided which technology it would use for the switching platform.

After evaluating other major switch manufacturers such as Northern Telecom, Inc. and DSC Communications Corp., which provide network switches for MCI's voice services, the carrier chose Siemens' Metropolitan Area Network Switching System (MSS), which has not yet been commercially released. A Siemens spokesman said the MSS is a cell-based packet switch capable of supporting both voice and data. It complies with the IEEE 802.6 standard for supporting Switched Multimegabit Data Services (SMDS) that transmit data up to 200M bit/sec.

Joe Terry Swaim, vice-president of system engineering at MCI, said that even though the MSS switch is not commercially available, the carrier opted for it because the gear is currently the most technically advanced and has the potential for supporting other high-bandwidth, digital services.

"Siemens has the most advanced cell-based switch [on the market]," Swaim said. "We are going to offer a wide range of switched data services, and we will evolve to a backbone that is eventually [capable of supporting Asynchronous Transfer Mode]." The MSS switch is available only

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DEC offers an array of products to boost call center productivity

DEC's CallCenterPlus tools support PBX-to-host applications.

By Bob Wallace
Senior Editor

BOSTON — Digital Equipment Corp. last week introduced CallCenterPlus, a set of new and existing products that make it easier for users to develop PBX-to-host applications to improve the efficiency of call centers.

Included in the components of CallCenterPlus are a new version of DEC's Computer-Integrated Telephony (CIT) software that runs on a wide array of DEC VAXes, as well as new voice response and facsimile software that DEC will resell from other vendors. DEC's CIT software enables private branch exchanges and hosts to exchange call information.

Analysts said DEC now offers a full line of call center products.

"DEC has worked hard to offer fully integrated solutions that help users get the most from their call centers," said Jim Burton, president of Computer-Telephone Link, Inc., a market research firm located here.

DEC entered the call center market nearly four years ago when it announced its CIT program at Telecom '87 in Geneva. Under CIT, DEC created an application program interface (API) to simplify development of applications built to integrate computers and PBXs.

DEC and associated software vendors have built applications that harness the combined power of VAXes and switches from AT&T, Mitel Corp., Northern Telecom, Inc. and Rolm Co. CIT-compatible switches can operate with stand-alone VAXes or with those linked in a DECnet local-area network.

Last week, DEC announced its latest CIT software, Version 3.0. The product supports the protocol that AT&T's Definity Generic 1 PBX uses to communicate with host computers, enabling users to integrate VAXes and Definity Generic 1s. CIT Server/VMS costs $6,900 and will be available next month.

DEC also implemented a CIT API for Ultrix, its version of Unix for VAXes and workstations. Prices for CIT Server/Ultrix range from $1,035 to $43,332, depending on configuration. The software is expected to be available next mon[illegible]

DEC's CIT platform c[illegible]

(contin

FCC meets with users, vendors on net outages

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Top FCC officials met with 30 user and industry representatives in a closed-door meeting last week to discuss what can be done to prevent public network outages.

As a result of the meeting — which included executives of major user groups, long-distance and local carriers, equipment manufacturers and trade associations — Federal Communications Commission Chairman Alfred Sikes has decided to establish rules outlining carriers' responsibilities during an outage.

"There's really not a universal system for notifying the FCC when outages occur," said an FCC staffer who requested anonymity. The proposed rules, which are expected to be released this week, would spell out time frames for carriers to report outages and specify what data carriers must report to the commission.

The FCC was criticized by some in Congress and the industry for doing too little during outages in July in the Bell Atlantic Corp. and Pacific Telesis Group service areas that left millions of customers without local service for several hours. Critics said the agency had no plan for dealing with such emergencies.

Organizations represented at the FCC meeting included the Ad Hoc Telecommunications Users Committee, International Communications Association (ICA) and New York Clearinghouse Association, as well as AT&T, DSC Communications Corp., MCI Communications Corp., Northern Telecom, Inc., US Sprint Communications Co. and the regional Bell holding companies.

Attendees agreed there needs to be more sharing of information about outages and testing procedures for equipment that goes into the public network. A representative from Bell Communications Re-

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Correction: The story "Banyan unwraps net capabilities for Unix" *(NW,* Aug. 26) incorrectly reported the name of Barry Burke, director of strategic product planning at Banyan Systems, Inc.

IBM extends its CallPath PBX/CPU software to hosts, workstations

By Joanne Cummings
Staff Writer

NEW YORK — IBM last week announced here new mainframe and workstation versions of its CallPath software, marking the first time it has offered the product for platforms other than its Application System/400 minicomputer.

The new members of the CallPath family include two versions that run under CICS on System/390 mainframes and two versions designed to run on Personal System/2 workstations.

The company also announced the SwitchServer/2, a PS/2-based interface used to link the CallPath platforms to a variety of telephone switches.

More than 20 IBM business partners attended the announcement to pledge support for IBM's CallPath Services Architecture and to unveil value-added applications for the System/390 and PS/2 products. The CallPath announcements "show IBM is serious about offering the ability to support the integration of computers and telephony on all its [Systems Application Architecture] platforms," said David Passmore, a principal at the consulting firm Ernst & Young in Vienna, Va.

Like the earlier CallPath product, the new versions are designed for use in call center environments to link computers to telephone switches, making it possible to deliver incoming calls to a waiting agent at the same time customer profiles or other data is forwarded to the agent's terminal.

The new mainframe versions, CallPath CICS/MVS and CallPath CICS/VSE, are for users running CICS in MVS and VSE environments on System/390 hosts.

The hosts are tied to private branch exchanges by using existing CICS support for LU 6.2 to communicate with a PS/2 configured with SwitchServer/2, which can simultaneously support as many as 120 hosts and works with the following switches: Rolm Co.'s 9751 CBX, IBM's Com300 2.3 and 3.1, Siemens AG's Hicom 300 2.3 and 3.1, Northern Telecom, Inc.'s Meridian 1, AT&T's Definity Generic 2 and NEC Corp.'s APEX/NEAX.

Prior to this, CallPath was only available for the AS/400, supporting Rolm 9751 CBX, IBM Com300, Siemens Hicom 300 and Northern Telecom Meridian 1 and SL-1.

IBM also announced two versions of CallPath for PS/2s. CallPath/2 is for users running OS/2 Extended Edition Version 1.3 on PS/2s, while CallPath/DOS for Microsoft Corp. Windows is for use with Windows Version 3.0. They operate with a stand-alone workstation or a network of workstations in a client/server setup.

CallPath CICS/MVS is scheduled for availability in March 1992 and has either a onetime or monthly licensing fee ranging from $148 to $3,055, depending on configuration. CallPath CICS/VSE, available in April 1992, carries either a onetime or monthly fee of between $88 to $3,055.

CallPath for Workstations, available in November, has either a onetime or monthly charge of $350 to $5,600. CallPath SwitchServer/2 costs $10,000 and will be available in March 1992.

MCI outlines plans for frame relay

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on a limited production basis, according to a Siemens spokesman. But an MCI spokeswoman said the firm is not concerned that it might run into delays, even though the MSS is not widely available. MCI is testing the Siemens switches in its laboratory and will begin installing the MSS in major switching centers in early 1992, Swaim said.

MCI will also conduct beta tests of its frame relay service with about six customers during the first quarter of 1992, according to Don Heath, vice-president of data marketing at MCI. The service is scheduled to be commercially available in the second quarter of next year.

Although MCI officials had said originally that the company was considering offering frame relay on its Northern Telecom DMS 250 Supernode switches, Swaim said the carrier decided against that approach. "Frame relay is the first of a family of switched data offerings. The Northern [Telecom] equipment that exists is pure frame relay, and that's just not of interest to us; that gives us a throwaway platform," he explained.

Although MCI has not officially announced which services it will support beyond frame relay, Swaim hinted that SMDS and ATM are likely candidates if markets develop. But he added MCI is not satisfied with the current Bell Communications Research standard for SMDS and there will have to be more work done. MCI will also evaluate ATM as a future service.

"I'll be bringing an ATM switch in here for evaluation late this year or the first of next year," Swaim said.

MCI will also provide frame relay customer sites with a Wellfleet Concentrator Node if customers do not already have appropriate equipment to access the service. Customers with routers will be able to upgrade them for use with the service.

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

The systems integration and facilities management market will more than triple in size from $3.5 billion in 1990 to $11.6 billion by 1996, according to a new report by INSIGHT Corp., a Livingston, N.J., market research firm.

People & Positions

Daniel Capone was recently named to the newly created position of vice-president of strategic relationships at **Proteon, Inc.,** a Westborough, Mass., maker of local-area network equipment.

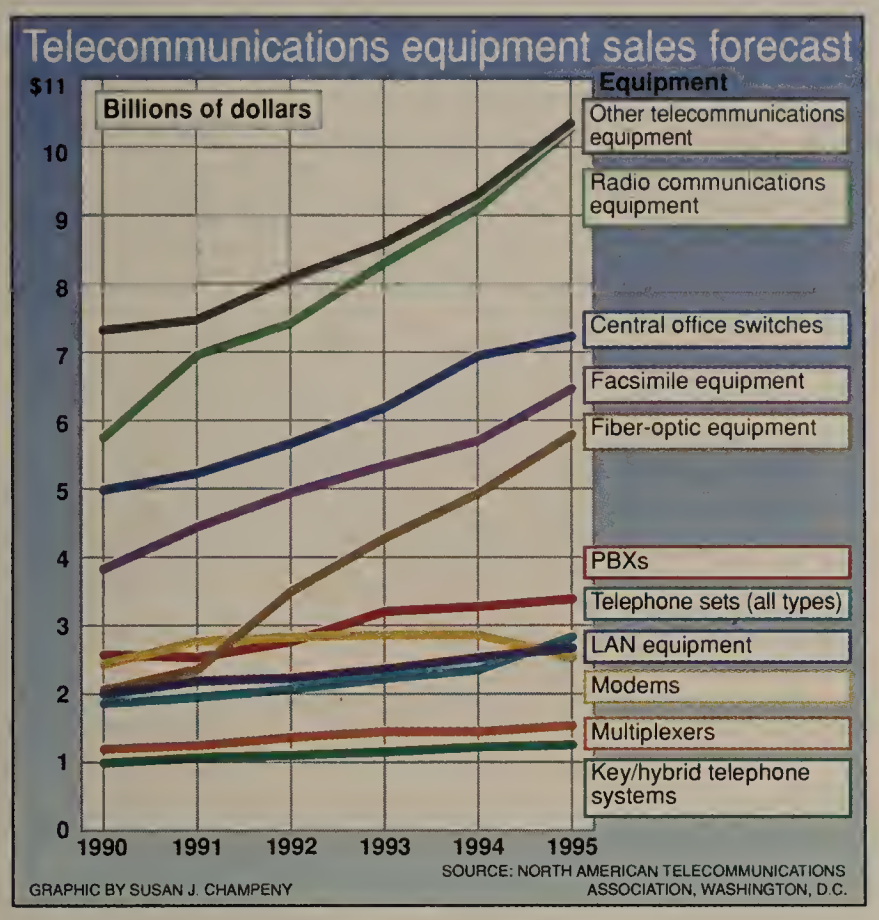
Capone will be responsible for managing Proteon's business relationships with systems integrators. His primary focus will be on Proteon's worldwide resale agreement with Digital Equipment Corp.

Previously, Capone was Proteon's vice-president of manufacturing operations.

Hewlett-Packard Co. recently named **Joel Birnbaum** vice-president for research and development and director of HP Laboratories, a post he previously held from 1984 to 1986.

He replaces Frank Carrubba, who served as director of HP Labs since 1987. Birnbaum will retain his current position as vice-president and general manager of the company's Information Architecture Group.

US West, Inc. recently named **John DeFeo** as president and chief executive officer of the **US West NewVector Group, Inc.** and president of **US West Spectrum Enterprises.** DeFeo, who will continue to head NewVector operations, will also be responsible for the strategic development of wireless communications technologies.



NATA study pegs markets to drive telecom sector

Voice processing, fax, radio nets lead growth.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — A recently released report from the North American Telecommunications Association (NATA) forecasts revenue from the U.S. telecommunications equipment market will grow 35% over the next five years to $54.5 billion by 1995.

The NATA study, "Second Edition — 1991 Telecommunications Market Review and Forecast," said private branch exchanges, key systems, multiplexers, modems and local-area network equipment, which have long been hotbeds of growth, will each account for only about 5% in revenue growth or a combined $11.3 billion of the entire U.S telecommunications market by mid-decade.

> The $4 billion fax market is set to grow to more than $6 billion in sales by 1995.
>
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By contrast, three newer segments — voice processing, facsimile and radio communications equipment — will average growth rates of over 11% and account for $21 billion in sales by 1995, the study said.

Some portions of the overall equipment market are dominated by telecommunications carrier purchasing requirements.

Large carriers, buying fiber-optic equipment and central office switches for network upgrades, will fuel over $13 billion in sales for these two market segments by mid-decade, the report said.

But end-user purchases of radio pagers, cellular telephones and network equipment will send the mobile communications market soaring from $3 billion today to $14.38 billion in 1995, according to the report.

Furthermore, the $4 billion facsimile market is set to grow to more than $6 billion in sales by 1995, the report stated, noting that customers will buy not only traditional fax terminals, but also innovative products such as fax boards for personal computers, fax servers and fax switches, which allow users to have one line for both voice and fax traffic.

NATA, a trade association of telecommunications equipment manufacturers, emphasized the new role of voice processing as a growth segment of the equipment industry in the report.

Although NATA tossed voice processing equipment into the nondescript "other" category in its broad industry profile (see chart, this page), the trade association's report nevertheless paid particular attention to the voice processing market.

NATA predicted that the

(continued on page 12)

IBM support bolsters FDDI cabling spec

Unified FDDI-over-shielded twisted-pair proposal likely to gain ANSI acceptance, reduce expenses.

By Bob Brown
Senior Editor

BOULDER, Colo. — IBM's recent decision to join a coalition of vendors supporting FDDI-over-shielded twisted-pair cable virtually assures users the effort is a good bet to become an ANSI standard.

The emergence of a unified FDDI-over-shielded twisted-pair proposal should give users confidence that products supporting the unified specification will interoperate, observers said.

FDDI-over-shielded twisted pair is considered a potentially large market because it will enable users to support 100M bit/sec data transport over the considerable installed base of shielded twisted-pair cabling, saving users from the expense of installing new wiring.

FDDI-over-shielded twisted-pair supporters also argue that the cabling is a better medium for supporting FDDI than unshielded twisted-pair wiring, due to concerns that electromagnetic interference distorts signals operating over the lower cost, unshielded copper wire.

At the ANSI X3T9.5 Twisted-Pair — Physical Layer Medium Dependent committee meeting here last month, IBM joined forces with the "Gang of Five" — Advanced Micro Devices, Inc., Chipcom Corp., Digital Equipment Corp., Motorola, Inc. and SynOptics Communications, Inc. — to support a common FDDI-over-shielded twisted-pair specification.

Last May, those five companies demonstrated interoperability of their FDDI-over-shielded twisted-pair specification and later urged IBM to consider backing a common specification to kick start the market.

An IBM spokesman said the vendor and members of the coalition still have some technical issues to work out regarding the proposal. He declined to comment on what affect IBM's cooperation on the FDDI-over-shielded twisted-pair proposal could have on the emerging market.

Other observers were less reserved. "I have no doubt the unified [FDDI-over-shielded twisted-pair] specification will become a standard now that IBM is behind it," said Michael Howard, presi-

(continued on page 12)

INDUSTRY BRIEFS

Bytex signs licensing agreements. Bytex Corp. of Southborough, Mass., last week announced technology licensing agreements with Xyplex, Inc. of Boxborough, Mass., and Fujikura, Ltd. of Tokyo. Under the deals, Bytex, a maker of matrix switches and local-area network hubs, will acquire backplane technology from Xyplex to add Ethernet support to its Maestro Intelligent Switching Hub, which already supports token-ring LANs. Fujikura will work with Bytex to produce 10Base-T modules that will enable Maestro to support Ethernet over unshielded twisted-pair wire. The Maestro hub upgrades are scheduled to debut at an unspecified date next year.

Telebit takes write-down to buy venture unit. Sunnyvale, Calif.-based Telebit Corp., a maker of high-speed modems and other wide-area communications products, recently announced the company will take a $5 million charge against its third-quarter operations. Telebit said the write-down was required in part by the company's buyout of Morgan Stanley Research Ventures' 49% share in the joint venture, Telebit Ventures.

Under the terms of the original 1988 Telebit Ventures agreement, Telebit had the right to buy out Morgan Stanley's share a year after the introduction of the T3000 V.32bis modem, which was the final product developed under the venture. Of the $5 million charge, Telebit said $2.6 million represented licensing rights to certain software and data communications technology purchased from other parties.

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RBHCs, Justice Dept. bid to overturn Greene order

Carriers want access to info services market now.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The regional Bell holding companies continued their legal jockeying last week by pressing forward with an effort to override a stay ordered by U.S. District Court Judge Harold Greene that prevents them from providing information services.

The RBHCs and the Department of Justice were sharply critical of Greene's efforts to keep the regional carriers out of information services until all appeals on the case are exhausted. In motions filed with the U.S. Court of Appeals for the District of Columbia Circuit, the two parties said Greene overstepped his authority by ordering the stay because he cannot legally justify the order.

The carriers and the Justice Department claimed that leaving the stay in place until all appeals are completed — a period that could be as long as one or two years — will prevent the RBHCs from making revenue from legitimate ventures and delay the introduction of new services.

It is not known how quickly the court will act on the request to lift the stay.

Possible chaos

Greene said there is a possibility that his order lifting the ban will be overturned on appeal. The industry would then be plunged into great confusion if the RBHCs are permitted to provide information services in the interim.

If the RBHCs are successful in having the stay lifted, they would be free to immediately begin providing offerings such as news, financial information and data base services.

In July, Greene reluctantly lifted the Modified Final Judgment ban that had barred the RBHCs from providing information services.

Greene said he felt compelled to lift the ban because the same appeals court last year sent the case back to him for review with instructions that gave him narrow latitude in determining whether to lift the ban.

However, Greene said he may have misinterpreted some of the appeals court's instructions and, therefore, issued a stay pending appeals of the order. He denied an attempt to have the stay lifted by his court.

The RBHCs and the Justice Department last week told the appeals court it is extraordinary for a judge to issue a stay pending appeals of a case, an action they claim Greene failed to legally justify.

Normally, parties seeking a stay must show that they will suffer irreparable harm, other parties will not be harmed by the stay, the public interest is served by the stay and the appeal is likely to win. The local carriers and the Justice Department say Greene failed to prove these four points.

Retix signs integrators to sell LAN-based X.400 pack

By Ellen Messmer
Washington Correspondent

SANTA MONICA, Calif. — Retix last week said it has signed a handful of national resellers to market OpenServer 400, the vendor's X.400 messaging software for personal computer-based local-area networks.

Under Retix's new Reseller Authorization Program, BDS Corp., Evernet Systems, Inc., Government Technology Services, Inc. and USConnect Partners, Inc. will initially sell and support the server-based X.400 software.

Until now, a small band of Retix employees have promoted the software on a direct marketing basis. However, the company said it instituted the reseller program because customers, who are increasingly dealing with network integrators and other resellers, wanted the software available from those sources.

"X.400-based solutions such as OpenServer 400 have moved from a trial basis to enterprisewide deployment, driving us to develop a highly trained, end-user-oriented sales channel," said Kent Bridges, an associate vice-president for North American sales at Retix.

Under the reseller program, Retix will provide technical training and certification to qualified network resellers and integrators.

The company also said the software has been repackaged for sale and installation by resellers. Retix added a set of Microsoft Corp. Windows-based configuration utilities to make installation easier for resellers and LAN administrators.

OpenServer 400 is the only end-user product offered by Retix, traditionally a supplier of Open Systems Interconnection source code to other vendors. A company spokeswoman said the OpenServer 400 software is strictly for LANs, while the firm's X.400 source code used by other vendors is used on high-end mainframe and minicomputer systems.

Chancy endeavor

The new reseller program represents a gamble for Retix in a market where OSI products have garnered a reputation for being difficult to install and vendor support is closely scrutinized by users.

To allay user concerns, officials at Retix last week said Version 1.3 of OpenServer, scheduled to ship by the end of the month, will be much easier to install.

David Knight, director of market development at Retix, said Version 1.3 can be installed by the end user via a DOS-based Windows utility from any station on the network.

According to Bridges, Retix has set strict technical support demands for the resellers it accepts into the program, stipulating that resellers must participate in technical training sessions given by the vendor to obtain status as a Certified OpenServer Engineer.

Knight pointed out that users may find advantages in dealing with the net integrators as opposed to Retix's limited sales force.

Retix executives said the integrators, offering a full line of internetworking equipment and software, should be in a more favorable position than Retix in assisting a company in implementing X.400 across its enterprise.

Bridges said that if the reseller program proves successful, Retix may eventually stop direct sales of OpenServer 400.

NATA study pegs markets to drive

continued from page 9

voice/call processing market will account for $4.47 billion in sales by 1995, showing an annual compound growth rate of 14.6% between 1990 and 1995.

"The boost in voice processing equipment reflects the growing acceptance of business customers to 'talk to a machine,' " the report concluded.

Voice processing equipment

The NATA report categorized the voice processing equipment market into three main types of systems — voice response, automated call distributor (ACD) and voice messaging.

The voice messaging market, commonly known as voice mail, grew from $5 million in 1984 to $800 million in 1990, the report stated. This market segment is expected to grow to $1.2 billion by 1995.

Voice response systems, which typically allow a customer transaction to be handled through an automated voice process on either an interactive or noninteractive basis, grew from $10 million in 1984 to $563 million in 1990. This market will surge to $1.4 billion by 1995 as new applications develop, NATA predicted.

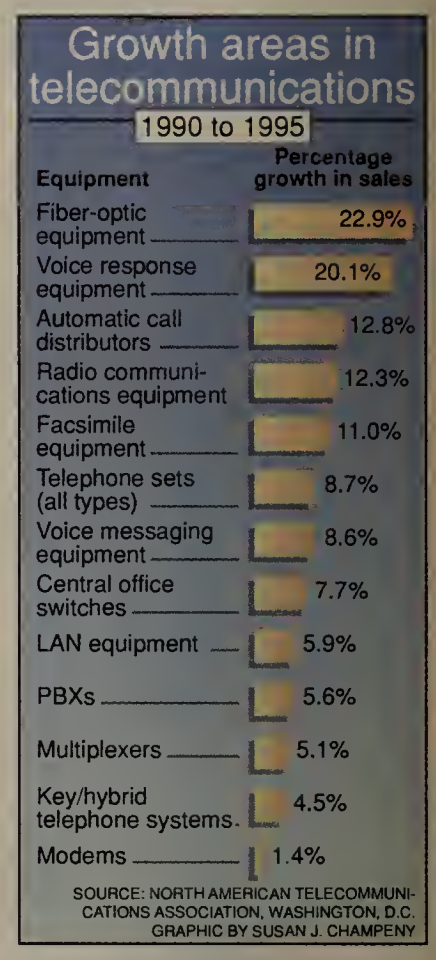
The market for ACD systems, which hand off incoming calls to the proper agent, went from $95 million in 1984 to $500 million in 1990 and is expected to hit $915 million by 1995.

NATA also conducted an analysis of the current market leaders in the three categories. Octel Communications Corp. leads with a 21% share of the voice messaging equipment market, slightly ahead of AT&T's 17% share, in a market that includes nine other contenders.

The statistics for the voice response market reveal even less clarity about market leadership, showing AT&T with 10% in a field of nine other named contenders with less than 10% each, and with fully 40% of the market held by "others."

Another market segment predicted to grow is videoconferencing. A NATA spokeswoman, acknowledging that videoconferencing is a new area of study for the trade association, said NATA relied on statistics from the International Teleconferencing Association's (ITCA) annual study to include in the NATA report. The ITCA statistics show the videoconferencing market growing from $299 million in 1990 to $429 million in 1991.

"Growth can be accounted for by the expectation that within one to two years, nearly all personal computers on the market with have the capability to input, store and transmit video images," the NATA report concluded.



IBM support bolsters FDDI spec

continued from page 9

dent of Infonetics Research, Inc., a San Jose, Calif., market research firm. "This move on the part of IBM and the other vendors should give the [FDDI-over-shielded twisted-pair] market some momentum."

IBM's decision to throw its weight behind the group's effort is viewed as critical because the installed base of shielded twisted pair is mainly in IBM accounts, said Nick Schommer, a product marketing manager at SynOptics. SynOptics earlier this month announced its first FDDI-over-shielded twisted-pair products, which support the proposed specification.

"Customers are given more of an assurance that [FDDI-over-shielded twisted pair] is real and is going to happen with IBM behind it," he said. "With a critical mass of vendors behind it, [FDDI-over-shielded twisted pair] is a solution users can implement in the near term."

User acceptance of FDDI-over-shielded twisted pair, however, will be affected by several other standards-related issues, observers said.

Most significantly, ANSI has not yet decided whether it will approve a separate FDDI-over-shielded twisted-pair standard or bundle it under a standard that also includes FDDI over less expensive, more ubiquitous unshielded twisted-pair cable, said Karl Pieper, FDDI marketing manager for DEC. ANSI is expected to decide on a direction by year end.

The FDDI-over-shielded twisted-pair specification being backed by the group is more complete than any other twisted-pair proposals, but anything can happen in the standards setting process, Pieper warned.

SynOptics' Schommer said that the prospects of settling on even a common FDDI-over-unshielded twisted-pair specification — never mind a common FDDI-over-shielded twisted-pair and unshielded twisted-pair specification — could take a long time since the two distinct camps of vendors pushing for an FDDI-over-unshielded twisted-pair specification appear to be far apart.

"The [shielded twisted-pair] specification is pretty solid now and technically doable," he said. "It will take a bit longer to get one converged [unshielded twisted-pair/shielded twisted-pair] spec."

TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

"There are more people confused by cabling options than there are about the actual PBX acquisition."

Bruce Robin
President
Robin & Dackerman
Marina Del Rey, Calif.

Carrier Watch

Southwestern Bell Telephone Co. last week announced that the Federal Reserve Bank of St. Louis recently began using SecureNet, the carrier's self-healing fiber-optic network service.

The bank is the first user of the service, which is designed to minimize network outages in the local loop by providing physically diverse routes to customer sites. If the primary transmission path fails, the alternate path is selected within two seconds.

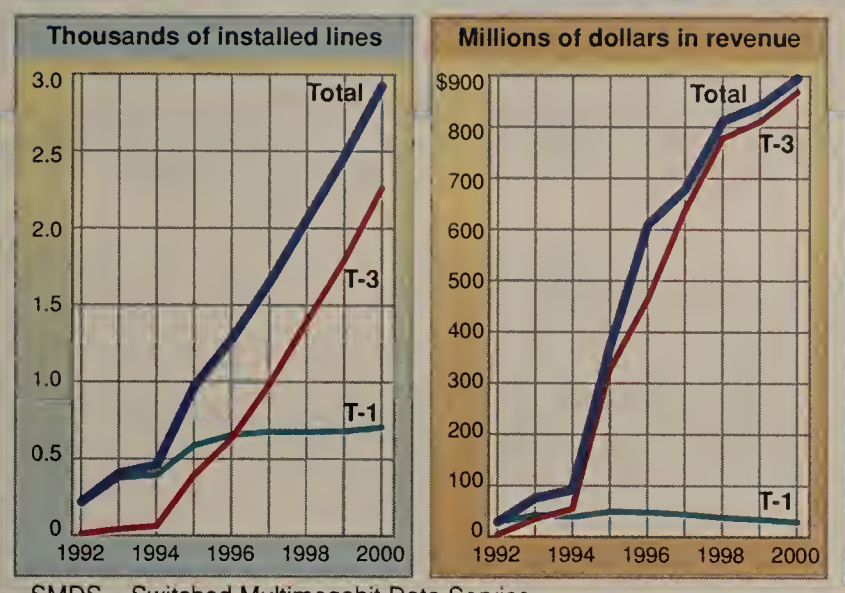
SecureNet is offered as an optional feature on Southwestern Bell's 1.544M bit/sec High-Capacity interstate service and its 45M bit/sec MegaLink Custom interstate offering.

The bank is using SecureNet because the Federal Reserve System requires it to have plans to quickly restore or avert the loss of service in the event of a disaster. The bank plans to add two more SecureNet circuits for its electronic data transfer service, according to a Southwestern Bell spokesman.

MCI Communications Corp. recently announced a five-year, $10 million contract to become the exclusive provider of 800 services for Equifax, Inc.'s new Information Service Center in Atlanta.

The Equifax center, which will open in December, will advertise a single MCI 800 number for customers to dial for credit reporting information. MCI will provide 800 call routing features and customer-managed emergency routing features for the center.

RBHC installed SMDS base and revenues



SMDS = Switched Multimegabit Data Service

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: TRANS-FORMATION, INC. TULSA, OKLA.

FAA asked to account for overdue, over-budget net

GAO says voice/data net is $1 billion over budget.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The U.S. General Accounting Office (GAO) said in a report released last week that the Federal Aviation Administration (FAA) is continuing to struggle with development of a network that is already eight years behind schedule and more than $1 billion over budget.

In 1982, the FAA set out with $258 million to develop a transmission system, dubbed the Voice Switching and Control System (VSCS), and new sophisticated computer workstations for air traffic control. The workstations will be designed to work specifically with VSCS to process air traffic information and cannot be fully tested until the network is in place.

VSCS will be deployed at 24 air traffic control centers across the country and is expected to serve as many as 430 controllers at each center. The new system is needed to accommodate large increases in air traffic. It will be used for air-to-ground communications between controllers and pilots, as well as for ground-to-ground communications between controllers, supervisors and support personnel at control centers.

The FAA wants the capability to reapportion the amount of airspace handled by any given controller several times a day in response to changes in staffing, air traffic and equipment availability around the country.

In order to perform this reconfiguration task, the VSCS must be able to automatically reassign radio frequencies and reroute incoming calls — capabilities that the current system does not have. The workstations used by air traffic controllers must also support new capabilities such as the reconfiguration of maps and displays to match the changes in airspace control.

In addition to these new capabilities, the FAA is demanding that the VSCS have less than four seconds of downtime per year, a reliability figure of 99.99%.

The FCC has been working with two contractors on VSCS — AT&T and Harris Corp. The project has run into significant problems both with flawed prototypes that are incapable of fulfilling FAA requirements and with significant hardware and software development that was unanticipated for the communications system.

VSCS and the new workstations are expected to be implemented in 1994 at a cost of $1.5 billion. AT&T and Harris have been granted two different extensions for coming up with workable prototypes, and the FAA is expected to choose a prototype in December.

Until then, the FAA will explore interim technologies that can be used for workstations on the new VSCS. This action was advised by the GAO, which conducted an earlier investigation into the problems plauging VSCS.

The GAO concluded that although the FAA is taking appropriate steps to reduce the risk of cost overruns and ineffective equipment, it still has a significant challenge ahead to implement the new system by 1994.

Airline beta-tests ACD mgmt. system

Northern Telecom's Network Administration Center centrally controls two Meridian 1 ACDs.

By Bob Wallace
Senior Editor

VANCOUVER — Canadian Airlines International, a beta test site for Northern Telecom, Inc.'s Network Administration Center (NAC), said the system lets the company for the first time centrally manage its two large call centers.

The airline said it is pleased with NAC, which it uses to manage its 300-agent reservation center here and a 250-agent center in Toronto, despite some early minor problems with report generation capabilities.

"Before NAC, management at our Calgary [Alberta] world headquarters had no visibility into the network," said Don Harding, Canadian Airlines' telecommunications manager. "They couldn't see what was happening at our reservation centers."

At the heart of it

NAC is the nucleus of a new line of call center management products, collectively known as Meridian Call Center, that Northern Telecom is expected to announce soon ("Northern Telecom to roll out ACD mgmt. tools," *NW*, Sept. 9).

NAC is the company's first product that enables network administrators to centrally manage networks of Meridian 1 automatic call distributors (ACD).

The NAC is based on a Hewlett-Packard Co. Vectra RS/25C personal computer outfitted with NAC software, 8M bytes of main memory, a 155M-byte hard drive and an eight-port concentrator. The concentrator is used to support supervisory terminals and printers.

The NAC polls each remote Meridian 1 ACD once every 10 seconds over either dial-up or 9.6K bit/sec dedicated links to collect agent, call and trunk statistics for consolidated management reports.

Before Canadian Airlines began testing the NAC, management staff at the airlines' headquarters received separate reports from the call centers, which had to be manually con-

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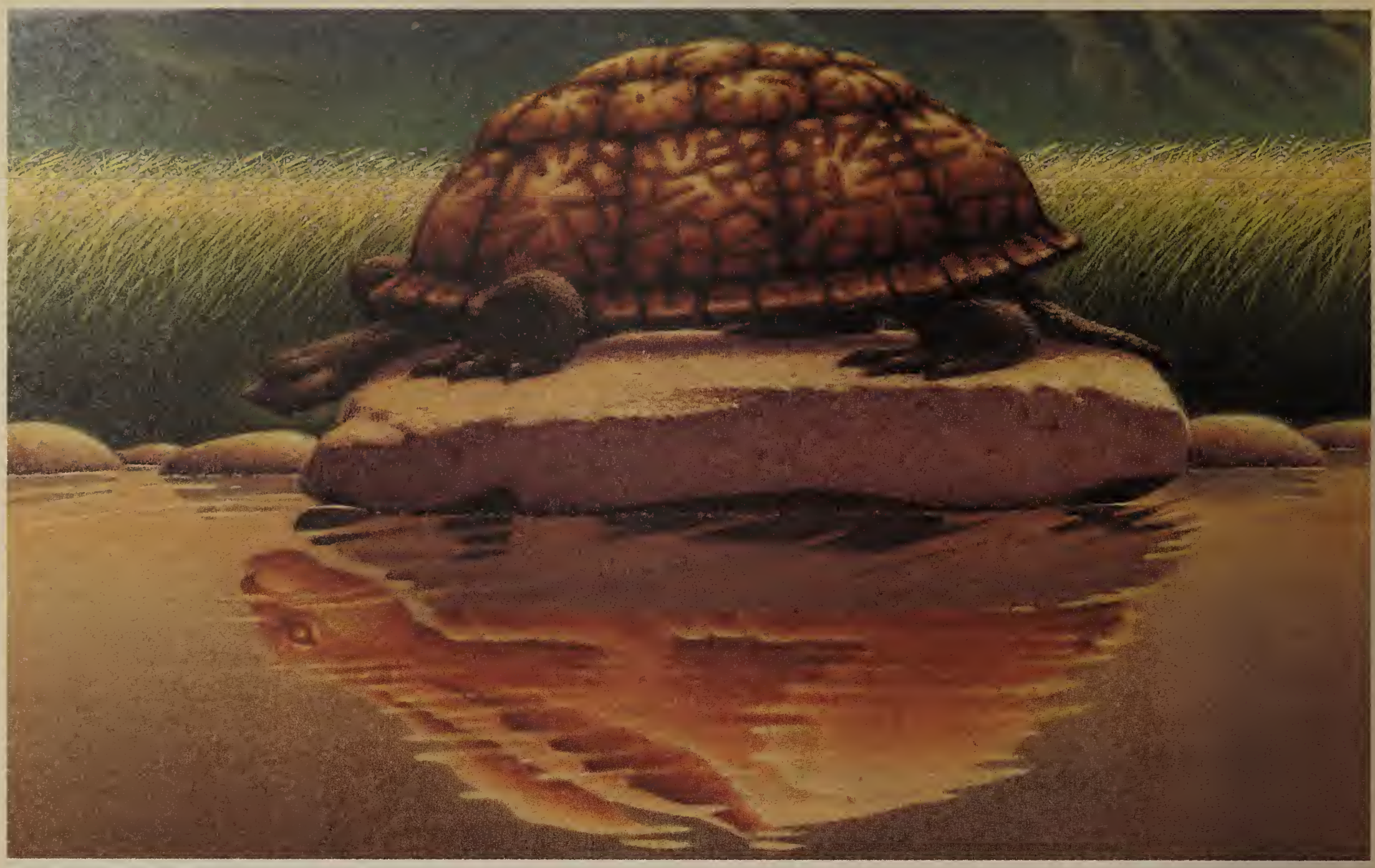
WASHINGTON UPDATE

BY ANITA TAFF

AT&T rivals challenge Tariff 12 revisions. Three rival carriers last week protested changes AT&T has proposed for three Tariff 12 customers — CXS, Inc., Litton Industries, Inc. and PaineWebber, Inc. MCI Communications Corp., US Sprint Communications Co. and WilTel last week said in petitions that the revisions are unlawful and asked the Federal Communications Commission to reject them. Their complaints were prompted by an FCC decision on Aug. 1 banning AT&T from including 800 service in new Tariff 12 deals and freezing existing deals. FCC staffers have said that no major revisions will be allowed for existing Tariff 12 nets, but until the agency releases its order, the fate of such revisions will remain unclear. The three carriers have also protested changes to deals for Metropolitan Life Insurance Co. and two other unnamed customers. Those changes were requested after Aug. 1 as well.

AT&T proposes 800 discount plan. AT&T recently told the Federal Communications Commission it wants to offer a new discount plan for 800 service, dubbed AT&T 800 Plan K. The new deal will allow customers in the U.S. to designate area codes from which they will receive calls and get a discount. AT&T is offering the Plan K discount for area codes in the U.S., Puerto Rico and the U.S. Virgin Islands. Charges for 800 Plan K include a $6 recurring fee per routing arrangement plus $18.90 per hour of use. The deal carries an installation charge of $30 plus $35 per area code selected. Other charges apply if customers later change 800 numbers or area codes.



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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

"Nobody should assume that [IBM's Systems Application Architecture] is cast in concrete. It will keep evolving. If people are committing to SAA today hoping they would not have to evolve again later, they may have some unpleasant surprises down the road."

Atul Kapoor
Vice-president
Kaptronix,Inc.
Haworth, N.J.

Data Packets

Hewlett-Packard Co. last week said its HP X.400/9000 product has passed the U.S. Government Open Systems Interconnection Profile conformance tests for the OSI X.400 Message Handling System.

HP claimed it is the first vendor to pass the tests, which is required in order to sell OSI products to the goverment. The product also received the first seven-layer COS Mark from the Corporation for Open Systems International, HP said.

Also on the conformance front, **Network Equipment Technologies, Inc.** recently announced its Quad Analog Voice Port (QAVP) and Primary Rate Card (PRC) for the IDNX line of T-1 multiplexers has met the compatibility standards for use with AT&T's M24, Megacom, Megacom 800 and Software-Defined Network services.

The QAVP provides an analog interface to the IDNX that eliminates the need for external channel banks and echo cancellers.

The PRC provides a channelized T-1 and can be employed for clear-channel applications that use out-of-band signaling.

BBN to build high-speed broadband cell relay switch

Switch will support T-1, T-3, SONET and FDDI.

By Paul Desmond
Senior Editor

CAMBRIDGE, Mass. — BBN Communications Corp. this week will announce its intention to build a broadband cell relay switch based on a busless technology.

BBN's new switch, codenamed Emerald, will support the gamut of high-speed interfaces, including T-1, T-3, frame relay, Synchronous Optical Networks (SONET) and Fiber Distributed Data Interface. It is based on Asynchronous Transfer Mode (ATM) cell switching technology using a standard 53-byte cell.

BBN's announcement this week will shed light on the few details the company provided when it first disclosed its plans for Emerald last November ("BBN reveals plans for cell relay switch," *NW*, Nov. 12, 1990). For example, the company confirmed that it will use a so-called butterfly design — which allows for expandable switching capacity — that has shown up in other BBN divisions' products, such as the TC/2000 parallel computer.

The butterfly technology is used in Emerald's core switching matrix, which is formed by a series of switch matrix cards, said Paul Parker-Johnson, director of planning for BBN. Each card connects any of 12 input channels to any of 12 outputs. The entire matrix can be expanded by adding more switch matrix cards and connecting them.

Each channel supports an effective throughput rate of about 160M bit/sec, more than enough to handle an FDDI or SONET Optical Carrier 3 channel, which operate at 100M and 155.52M bit/sec, respectively.

Mark Lunardoni, product marketing manager at BBN, said the busless architecture offers a number of benefits as compared to the buses used in time-division multiplexers (TDM), including the ability to incrementally grow the switch.

Parker-Johnson said there is no theoretical maximum as to the number of matrix cards Emerald could support and that it should accommodate hundreds of high-speed ports.

"There's the additional aspect of how big a network I can build with this device," he said. "We're designing the network to handle over 1,000 nodes if needed."

The busless architecture also supports the ability to change line cards in one switching matrix without the risk of disrupting us-

(continued on page 18)

COS, Air Force to develop OSI protocol analysis tool

By Ellen Messmer
Washington Correspondent

MCLEAN, Va. — The Corporation for Open Systems International (COS) recently signed an agreement with the U.S. Air Force to develop an automated protocol analysis tool based on the X Window System.

The tool would assist network specialists designing new communications protocols for Open Systems Interconnection networks by enabling them to develop an electronic version of the protocol design and test it against simulated network conditions.

The tool will allow designers to quickly ascertain whether a new protocol design conforms to OSI specifications, said Ed Albrigo, COS director of engineering services.

"It's a way of trying to eliminate the paper specifications, to speed up the modeling of OSI protocols," he said.

Albrigo said the Air Force has expressed interest in making the protocol analysis tool publically available on its completion in order to further the development of OSI.

The Air Force is funding development of the tool and will own the rights to the specifications and software.

The tool would be able to automatically simulate how a proposed protocol, such as a new application-layer protocol, would interact with protocols in the other six layers of the OSI reference model operating in a network.

Under a contract signed last week, COS and the Air Force are targeting a two-year delivery date for the automated protocol analysis tool.

The integrated tool will use the X Window System as the graphical user interface for the tool's protocol interaction simu-

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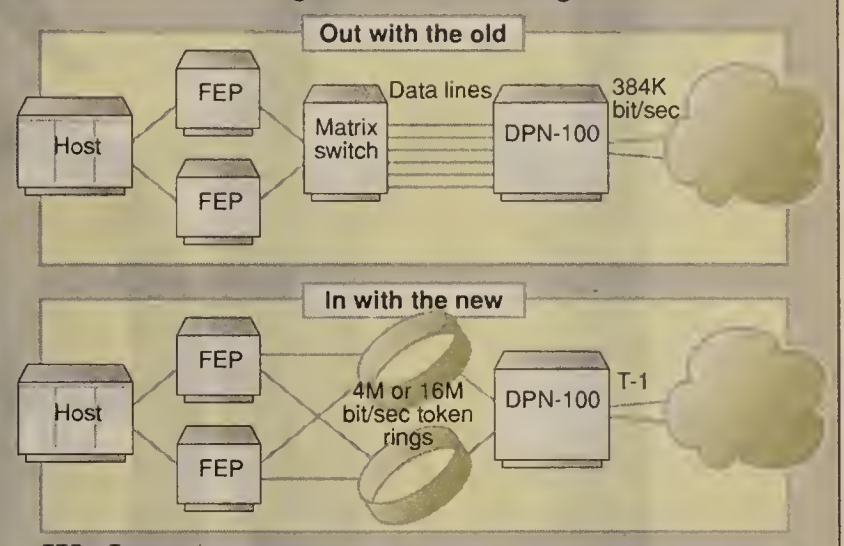
DPN-100 gets token-ring face-lift



FEP = Front-end processor

Northern Telecom's DPN-100 packet switch now supports token-ring connections, enabling users to replace multiple FEP connections with a single LAN link and to use additional LAN links for redundancy.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: NORTHERN TELECOM, INC. RESEARCH TRIANGLE PARK, N.C.

Northern Telecom ups DPN-100 support

Company enhances packet switch with support for frame relay, T-1 links and token-ring interface.

By Paul Desmond
Senior Editor

RESEARCH TRIANGLE PARK, N.C. — Northern Telecom, Inc. last week announced a number of enhancements to its DPN-100 packet switch, including support for frame relay and T-1 links as well as new token-ring interface boards.

Frame relay services will be able to work with the T-1 links to provide users with significant throughput gains on the DPN-100. Token-ring support will reduce port requirements when connecting the switch to a front-end processor, while also increasing performance.

"Providing T-1 access and trunking support in combination with frame relay is going to be a real strong sell for them," said Ginny Mellinger, senior analyst at International Data Corp., a market research firm in Framingham, Mass. "[The token-ring support] is something I have not run across before. I think it's a real differentiator for them."

Mike Doss, vice-president and general manager of Northern Telecom's Data Networks Division, said the company will offer frame relay via a software upgrade to the DPN-100. The technology will offer 30% to 40% greater data throughput as compared to X.25 by reducing the amount of error checking the switch has to perform at each intermediary node.

Northern Telecom has always used a proprietary frame relay format to ship data between its packet switches, Doss said. The new frame relay software will accept packets formatted according to the ANSI frame relay standard, then swap out the address with Northern Telecom's proprietary addressing scheme before shipping it to the appropriate remote port.

The new software will support the Local Management Interface specification, which addresses such issues as congestion management. It costs $70,000, which converts any existing port to a frame relay port at the same speed. To upgrade to a T-1 frame relay port requires an additional $16,500 worth of hardware.

Northern Telecom will also offer a new T-1 interface board for all its DPN-100 switches. The board will support channelized, fractional or full T-1 links on both the local and network side as well as the 2.048M bit/sec E-1 standard. The DPN-100 currently supports a maximum port and trunk speed of 384K bit/sec. Each T-1 board supports a single T-1 interface and costs $9,500.

To help users improve performance and simplify data center wiring, Northern Telecom announced the new DPN-100 Token-Ring Host PAD. Based on a Texas Instruments, Inc. token-ring chipset, the new adapter board will enable users to connect a DPN-100 switch to a front-end processor via a 4M or 16M bit/sec token-ring local-area network.

"It gets rid of the rat's nest that's existed in the past where you've had lots of ports on the

(continued on page 18)

Déjà Va

THE NEW COMPAQ DESKPRO 486/50L.

Seems we've been here before. Once again, the most powerful PC you can buy—in fact, the most powerful in existence—comes from Compaq.

The new COMPAQ DESKPRO 486/50L Personal Computer has everything for the most voracious power users, and for intensely demanding networks. It has Intel's fastest, most powerful microprocessor—the 50-MHz 486 (more than 50% faster than the 33-MHz 486). A second-level cache so big (256 Kbytes) that 99% of the time, the data you need will be instantly accessible. A more-than-generous 8 megabytes standard RAM. Superfast 12-ms fixed disk drives for superfast access to stored data. Advanced VGA graphics. Plus a full complement of EISA 32-bit bus master expansion slots. It's COMPAQ FLEX Architecture at its finest, providing the speed and performance that power users crave.

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COMPAQ

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Airline beta-tests ACD mgmt. system

continued from page 13

solidated in order to analyze and determine how to best manage incoming calls.

"With NAC, management can log on to the system and put together consolidated reports as often as they need them," Harding said.

"The reports are customizable and give us an up-to-date status report on both reservation centers."

A snapshot of activity

Bob Greenaway, Canadian Airlines' reservations planning and productivity manager, said the reports provide a snapshot of call and agent activity at both its centers.

"Before NAC, we took the individual call center profiles, which we received once a week, and studied each," said Greenaway. "Now we can work off a single system profile, which is easier."

The reports contain statistics that help the airline best plan its agent resources.

"With the reports, we can check the call arrival rate — the number of calls received at the centers every half hour," said Greenaway. "We can easily see where the calling peaks and valleys are. This helps us construct an agent shift schedule to meet demand."

The reports also contain trunk usage statistics that help the airline determine the number of lines needed between the centers to carry overflow traffic from one to the other, he said.

"This is important because we can dynamically allocate calls between the two centers quicker than we could bring agents on at either location," Greenaway said.

After-hours management of the Toronto center is also easier with NAC. After the shift supervisor at the Toronto call center leaves for the evening, the supervisor at the Vancouver center can manage the remote center from his NAC terminal, Harding said.

> "With NAC, management can log on to the system and put together consolidated reports as often as they need them," said Canadian Airlines' Harding.
>
> ▲▲▲

Before the airlines began using NAC, a supervisor could see what was happening at the other center but could not manage the second facility.

The airline experienced some difficulty with the reports early in the field trial — some contained minor errors — but Harding said the problem was quickly corrected.

The NCC feature

After analyzing the reports, managers can use NAC's Network Configuration Control (NCC) feature to adjust the ACDs to respond to changing traffic conditions, staff changes and networkwide traffic pattern shifts. NCC, for example, enables users to change routing tables in remote ACDs.

Harding said, however, that managers in Calgary don't often use NCC. "A lot of the time, [managers] just use NAC to monitor network operations. They can focus on one center or look at both of them."

But NAC will save Canadian Airlines network managers more than just headaches in managing its ACDs.

Before NAC, the airlines ran a dedicated data line from each center into the other and attached terminals at the remote end to enable call center managers to view operations at the other site. Each line cost $1,000 a month, and each terminal cost $1,300.

"We expect to save $2,000 a month by using NAC in place of the leased lines," Harding said.

The airlines is pleased with NAC and will continue to use the system now that the field trial has ended. "We're very happy with the system," he said. "And management is happy to have access to the network."

COS, Air Force to develop analysis tool

continued from page 15

lations across OSI protocol stacks.

Albrigo said COS has assigned two teams to work on separate design tasks. The first COS team will graphically model the application layer, the seventh layer of the OSI model, initially using 1988 X.400 Message Handling System as a test to ensure the tool can simulate the complex interactions with the lower layers required. The second team will graphically design the OSI layers below Layer 7 for use by the tool.

"We will then integrate the sets together," he said. "When the analysis is done, we should have a protocol analysis tool between the two systems sitting in a knowledge base."

Albrigo emphasized that the tool will fill a gap.

"There is no similar tool out there today that we can find," he said. "We did an extensive search, but we can't find anything publically available."

Such a tool could assist users and vendors working to craft new OSI protocols, particularly for applications and data routing.

For example, the Aeronautical Telecommunication Network project to establish an OSI-based net for the airline industry has launched an effort to develop a new OSI mobile communications routing protocol.

Northern Telecom ups DPN-100 support

continued from page 15

front-end processor and on the packet switch and lots of wires between each of those ports," Doss said. "That saves a lot of money and improves reliability."

Reliability can be improved by connecting each DPN-100 to two or more token-ring LANs, which in turn are connected to separate front-end processors. That configuration effectively lets users replace matrix switches, Doss said (see graphic, page 15). Performance is also improved with the token-ring speed of at least 4M bit/sec, a vast improvement over the DPN-100's previous maximum port speed of 384K bit/sec.

The software that supports the new packet assembler/disassembler costs $30,000 per network. Hardware costs are estimated at $6,500 per ring.

Northern Telecom last week also announced the DPN-100/1, a low-end version of the packet switch. At a cost of $72,000, it supports a total of nine ports and can be configured as a local or a remote device. The previous low-end model, the DPN-100/5, supported a total of 32 ports.

Northern Telecom also unveiled the DPN Expert Advisor, which is rules-based software that runs on the same Sun Microsystems, Inc. SPARCstation as the company's existing DPN-100 management software. According to Doss, the DPN Expert Advisor is an expert system that can reduce end-user downtime 33% by helping users pinpoint the cause of network outages.

The combined hardware and software costs $85,000, while the software alone is priced at about $60,000.

The DPN-100/1 is available now. The rest of the new products are scheduled for availability in December, excluding the frame relay software, which is due out in the spring of 1992.

BBN to build cell relay switch

continued from page 15

ers connected to another, Lunardoni said. By contrast, a glitch on a TDM bus affects all users.

Also, the Emerald's cell switching technology allows a single application to access the entire bandwidth on a 160M bit/sec channel but only while it is transmitting data; after that, other applications can use the bandwidth. With TDM, the bus bandwidth is divided up so that each channel is dedicated to an application, no matter if it is being used or not.

Charles Robbins, director of communications research at the Aberdeen Group, Inc., a consultancy in Boston, said BBN's busless architecture is in a class by itself.

"The closest anyone comes to this is Wellfleet [Communications, Inc.], and they're not even in the same business," Robbins said. "If anybody can pull this off technically, BBN can, judging by what they've done technically with some of their packet-switching products."

Lunardoni said Emerald would compete to some extent with products such as Wellfleet's recently announced 1G bit/sec Backbone Node router as well as with broadband multiplexers from vendors such as Adaptive Corp.

"Nobody that we see has carved out ATM for the private network as a niche, and that's where we're going," he said.

This week's announcement is only a statement of direction for BBN, and the company does not expect to have a product for demonstration until the fall of 1992.

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S. Robert Levine
President & CEO

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Cabletron's Multi Media Access Center intelligent wiring hub series connects Ethernet, Token Ring and FDDI local and wide area networks together in a single chassis. Our other hub products include standalone devices for 10BASE-T and Token Ring smaller connectivity environments.

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Remote LANVIEW®/Windows, the industry's first management software solution for SNMP Ethernet and Token Ring networks, was the world's first network management software package to offer completely integrated worldwide desktop LAN/WAN management from a central control console.

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Worth Noting

"Even though 3Com [Corp.] is out of the operating system business and both Novell and Microsoft [Corp.] are offering upgrade paths, I'm not one to change network operating systems unless there's a need to. If you have a stable solution, why migrate now?"

Michael Chacon
President
3Com Wizard Council

Netnotes

The **Du Pont Electro-Optic Products Group** recently unveiled a local-area network hub that will compete directly with products from market leaders Cabletron Systems, Inc. and SynOptics Communications, Inc.

The hub, called Paragon, will initially only support Ethernet connections. However, the company will add support for token ring by next year and ultimately include support for Fiber Distributed Data Interface.

The Paragon chassis has 20 slots and can support as many as 228 10Base-T unshielded twisted-pair, Ethernet connections using a 12-port module or up to 114 fiber-optic Ethernet links through a six-port optical module. The company, based in Research Triangle Park, N.C., also offers a dual-channel Ethernet multiport repeater module and a Simple Network Management Protocol (SNMP) agent module.

Paragon comes with Du Pont's Network Management Station Software, which works in conjunction with the SNMP module. With the module and software, the hub can control and collect statistics from any SNMP device on the network.

Paragon will be available in the fourth quarter of this year. Pricing will also be available at that time.

Wellfleet 1G bit/sec router gets kudos from net users

Will assist those building enterprise internets.

By Maureen Molloy
Staff Writer

Users applauded the recent introduction of Wellfleet Communications, Inc.'s gigabit-speed Backbone Node router, saying it will provide the increased performance and reliability necessary to build large, enterprisewide internetworks.

The 1G bit/sec router will enable users to accommodate emerging technologies like 100M bit/sec Fiber Distributed Data Interface local-area networks and high-speed wide-area network services such as Switched Multimegabit Data Service.

"I'm very pleased with the speed of this new router because we're interested in terminating one or more FDDI loops and a T-3 line into a single router," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co. in Wilmington, Del. "There's no router today that can smoothly handle that amount of data," he said.

Scoggin is halfway through construction of a wide-area multiprotocol internetwork that integrates LAN, Systems Network Architecture and other data traffic. His company is building a star topology net using 672K bit/sec links from Delmarva's data center to eight remote sites.

"We're already starting to outgrow the 672K links and are looking at multiple T-1s. I'm also migrating more of our SNA traffic onto the internet. It's clear I need a higher speed backbone," Scoggin said.

His current installation includes a Wellfleet Concentrator Node bridge/router in the data center that links to smaller Ethernet-attached Feeder Nodes at the remote sites. "I need fault tolerance because, in my current network design, if the [Concentrator Node] router goes down, I'm in trouble," he added.

Scoggin said he is also impressed with the new router's ability to support the interface cards in his current devices.

Robert Goldberg, principal network technologist at Northrop Corp. in Century City, Calif., said the Backbone Node fills a gap by helping users link high-speed LANs to high-speed WANs.

Goldberg currently uses Wellfleet Link Node bridge/routers to support communications speeds of 56K bit/sec up to T-1. He said Northrop intends to eventually use a much higher speed backbone.

"We're excited because there's nothing on the market today that can truly support FDDI-to-FDDI-to-[Synchronous Optical Network] routing," Goldberg said. "We've already implemented our first T-3 link and are looking for an opportunity to implement SONET to tie our campus networks together. Wellfleet's product could help us achieve that."

Vendor to announce first E-net/token-ring chipset

By Caryn Gillooly
Senior Editor

SAN JOSE, Calif. — Chips and Technologies, Inc. is expected to introduce this week the industry's first chipset that can be used in both Ethernet and token-ring network products.

With this dual-protocol chipset, called ChipsLAN, adapter card, hub and internetwork product vendors will be able to offer customers one product for both environments.

Increasingly, corporations are moving to mixed Ethernet, token-ring environments, said Farzin Firoozmand, strategic development manager for communications products at Chips and Technologies, based here. With this chipset, users will be able to buy one set of products — either adapter cards or hub modules — for both environments.

Products in the works

Firoozmand said several vendors are currently working with Chips and Technologies to employ the new chipset in their products, which could be available early next year, but he declined to name those vendors.

This introduction will also be the first time a token-ring chipset will be available from a company other than Dallas-based Texas Instruments, Inc.

According to Firoozmand, besides the dual-protocol support — which no other chip maker currently offers — one of the dif-

(continued on page 24)

Intel Corp.'s new product offerings

Network interface products	Price
EtherExpress16 LAN Adapter (ISA)	$199
EtherExpress16 TP LAN Adapter (ISA-unshielded twisted pair)	225
EtherExpress32 LAN Adapter (EISA)	795
External Ethernet Twisted Pair Transceiver	149
EtherExpress Boot ROMs (for Novell, Inc. NetWare and LAN Manager)	39
TokenExpress ISA 16/4 LAN Adapter	$695
TokenExpress MCA 16/4 LAN Adapter	695
TokenExpress EISA 16/4 LAN Adapter	895
TokenExpress external media filter (for unshielded twisted pair)	95
Remote Program Load ROM kits	95
LAN printing and fax products	
NET SatisFAXtion fax server software	$799
SatisFAXtion board	499
LANSpool FAX module (works with LANSpool 3.0)	295
LANSpool 3.0 (for NetWare 2.x)	395
LANSpool 3.0 (for NetWare 3.x, LAN Manager and LAN Server)	595
LANSpool Si 3.0 (for Hewlett-Packard Co. LaserJet IIIsi printer)	395
LANSpool upgrade to 3.0	195
Network management products	
NetSight Sentry (Ethernet)	$1,995
NetSight Sentry (Token ring)	2,995
NetSight Professional Enhancement (Ethernet)	6,495
NetSight Professional Enhancement (Token ring)	6,495
NetSight Analyst	995
NetSight Professional (Ethernet)	7,995
NetSight Professional (Token ring)	8,995
LANSight Support 2.0	395
LANSight upgrade to 2.0	95

EISA = Extended Industry Standard Architecture
ISA = Industry Standard Architecture
MCA = Micro Channel Architecture

GRAPHIC BY SUSAN J. CHAMPENY — SOURCE: INTEL CORP., SANTA CLARA, CALIF.

Intel offers bevy of LAN user products

Tries to differentiate its line — which includes network interfaces — on price and ease of use.

By Timothy O'Brien
West Coast Bureau Chief

HILLSBORO, Ore. — Intel Corp. last week launched its first significant push into local-area networking with the announcement of a line of interface cards, management products and software for LAN-based faxing and printing.

For Intel, the move is intended to stimulate the next round of growth in personal computers by making them easier to network and to lay the groundwork for multimedia products, two areas on which Intel is basing its future semiconductor business.

Intel concedes that users have viewed Unix workstations and Apple Computer, Inc.'s Macintosh as being more sophisticated and robust in terms of networking capabilities. "We are investing in this market to make sure that the networking architecture for personal computers is as good as if not better than the Unix or Macintosh [network] solutions," said James Flach, co-general manager of Intel personal computer enhancements.

Until recently, the only network products Intel sold were an Ethernet chipset and the NetPort print servers. With the May acquisition of LAN Systems, Inc.'s Network Products Division, however, Intel picked up a variety of network utility products and gained some needed LAN expertise and distribution channels.

LAN interface cards

With the introduction of Ethernet and token-ring interface cards, Intel is banking on its industry stature, low prices and product ease of use to capture a share of the thriving LAN adapter business.

The company's new line of Ethernet adapters is based on Intel's own integrated seven-chip design, which limits manufacturing costs and has enabled Intel to price the cards aggressively.

Intel is offering its EtherExpress16 LAN Adapter, an 8/16-bit Industry-Standard Architecture (ISA) card for thick- and thin-wire Ethernet, for only $199, and its EtherExpress16 TP LAN Adapter, a card for 10Base-T unshielded twisted-pair cabling, for $225. (See graphic, this page, for a complete listing of products.)

To simplify product use, Intel has eliminated the need for any switch settings on the boards, and

(continued on page 24)

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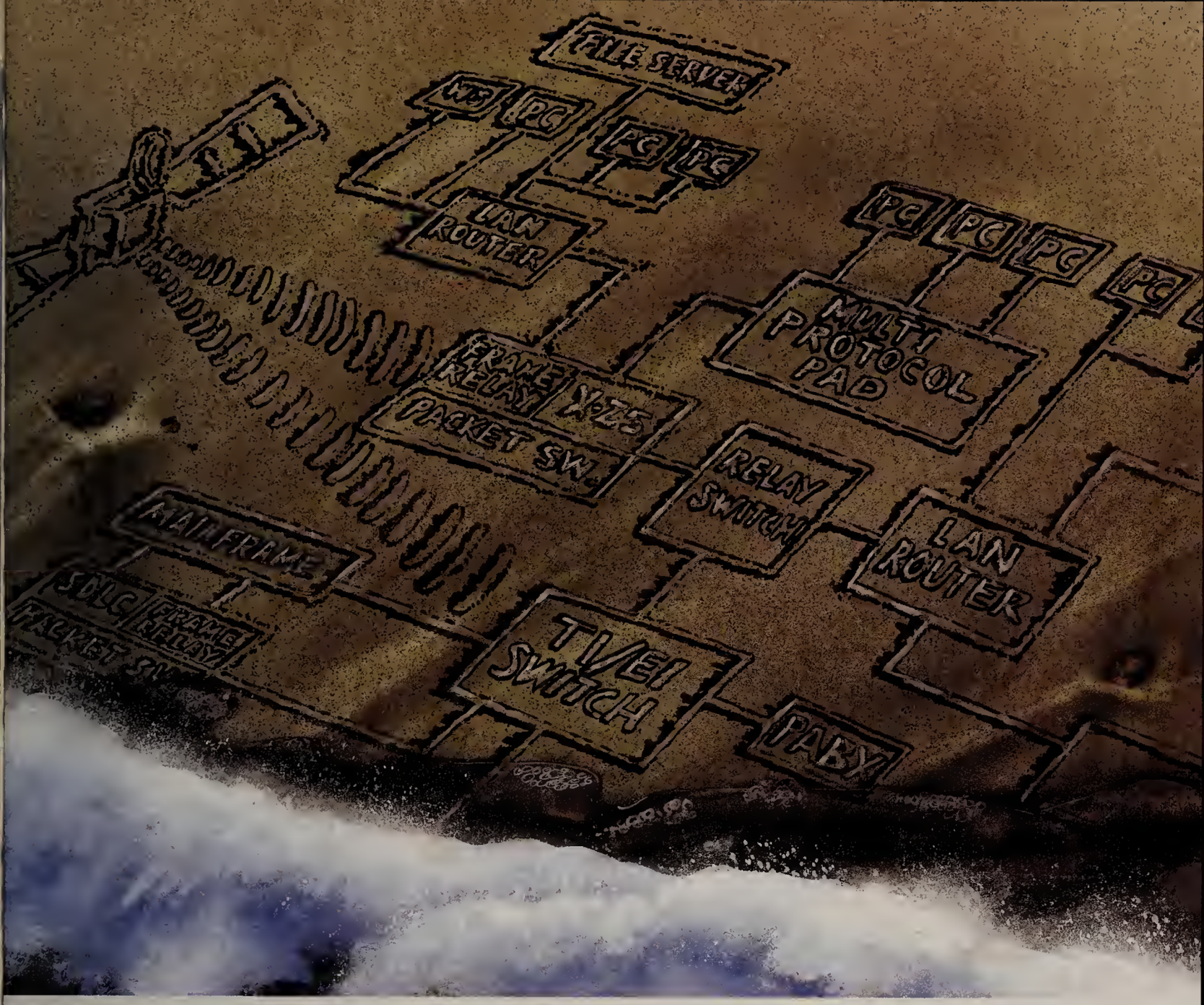

Will your network withstand the tides of change?

Certainly, to the networking professional, networks are not just a collection of boxes to be planned, installed, fine tuned, then ignored to the end of time. Your company's network is a dynamic, strategic weapon. A weapon that must constantly be redefined, restructured, and maintained as a critical, intelligent link, supporting your corporation's strategies.

Attempts to meet demands for greater functionality, higher efficiencies, new technology, change, often erode the network's effectiveness and can even undermine its ability to meet strategic corporate objectives. The problems inherent in adopting new technologies, in mixed computing architectures, compound the challenge. Unfortunately, so do most networking equipment suppliers.

Most networking equipment manufacturers perform well during initial sale, even through original installation. But because these suppliers have no strategy of their own to meet the impact of change, they blindly address the question of change, especially as it relates to their customer's corporate networking strategy.

For a networking equipment company to be a viable partner, the must be able to demonstrate a proficiency with the major elements of networking. First, they must have the ability to provide the range of intelligent networking solutions so that the appropriate technology can be utilized to enhance or build efficient networks. Second, the ability to blend technologies and products to perfectly fit the requirements, while maintaining the flexibility of the network, through future changes, new technology, and the accommodation of other vendor's equipment. Third, your networking partner must have the experience gained by being an acknowledged world supplier. Fourth, and most important, they must demonstrate a clear strategy of their own for implementing the first three elements of networking.

Only one company provides all The Elements of Networking. Only one company can help withstand the tides of change. Telematics.

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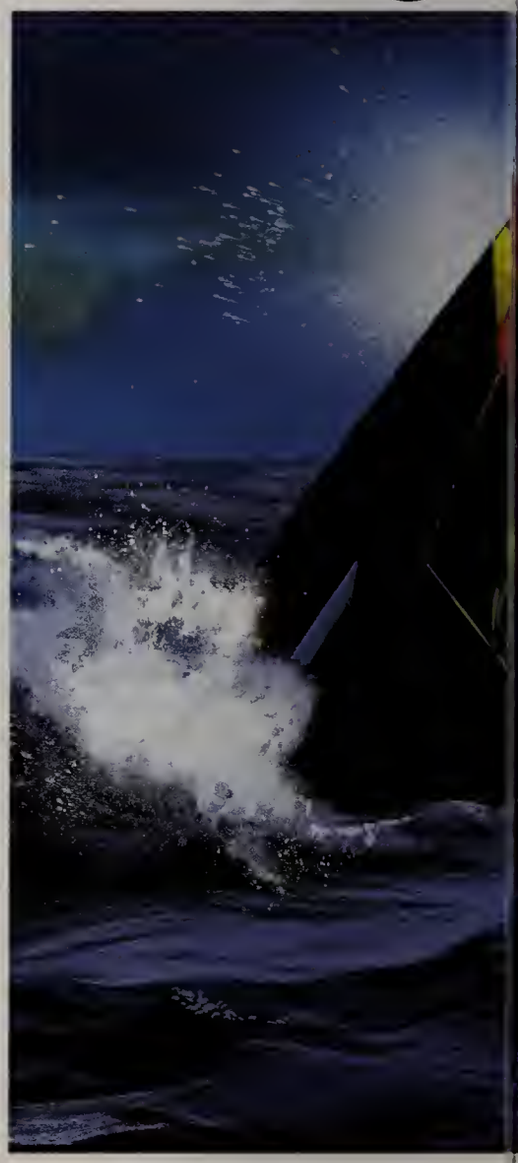
The *WISDOM* Of Integr

WIDSOM...to succeed—is not a new product and is not a new techuology. Rather WISDOM is a strategy for successfully navigating in the sea of exploding demands and the efficient implementation and integration of both proven and new networking technologies. It is the visiou, the techuology aud product based strategy of Telematics, and as such commuuicates our commitment to providing our customers evolutiouary growth paths from today's uetworks to tomorrow's uetworks.

WISDOM defiues comprehensive uetwork services, including Frame Relay, diverse uetwork access protocol support, cost effective internetworking for LAN-WAN connectivity and efficient flexible solutions for your network management requirements. And as the world shrinks and new technologies evolve, WISDOM will accommodate them.

WISDOM is our strategy for protecting your current investment and for dealing with the tides of change.



NET 25 *Plus Plus*

Telematics Net25 + + product line enhancements, incorporating Frame Relay Network Services and T1/E1 circuit switch services, extend our leadership position. The new NET25 + + management architecture not only supports these new functions but also provides the flexibility to manage other vendor's products while providing interoperability with different enterprise systems.

NET25 + + networks are based on proven Telematics technology, Access Communications Processors (ACP's), Digital Wideband Exchanges (DX's) and Programmable Communications Processors (PCP's). Each platform incorporates a hardware and software architecture permitting deployment to address access, concentration or backbone requirements.

NET25 + + is unique in the industry, supporting voice, data and video integration, OSI (X.25, Frame Relay) and all major standards, as well as value-added facilities and special protocols. In fact, Telematics products and our Telematics Application Partners (TAP's) can provide the most comprehensive range of network access protocols and applications in the industry.

Frame Relay

Telematics supports Frame Relay in addition to our range of network access protocols. NET25 + + with high performance X.25 and Frame Relay Services (T1 and E1 Speeds) is positioned to provide cost effective solutions for LAN-WAN connectivity utilizing public or private network services around the world.

Telematics WISDOM strategy will continue to bring to the market a range of functionality that will enable expanded network solutions incorporating Frame Relay and Access Services to address this emerging market.

Digital Wideband Networks (DX)

Telematics Wideband Networks Product Line provides us with the industries most flexible bandwidth management functionality, enabling very cost effective circuit switch networks, capable of integrating voice, data and video on a global basis.

You can configure your DX network using any of 250 trunk speeds, from 48 Kbps to 2.048 Mbps in 8 Kbps increments. This provides interfaces for the 1.544 Mbps T1 and the international 2.048 Mbps E1 standards. It also means you can build your network in smooth, incremental steps, using all digital transport facilities and services, including national and international carriers and satellite services.

The DX supports any kind of topology. So a small, point-to-point system can grow easily into a large mesh network.

The DX can handle any application that can be transmitted over digital facilities, including data, voice, video, Frame Relay, fax, X.25, low-bit-rate voice or LAN protocols. In North America, these facilities include T1, fractional or channelized T1, and 56 Kbps DDS service. In Europe and Asia-Pacific they include unframed G.703, framed and channelized G.732, as well as Nx64 Kbps facilities.

What's more, the DX voice support allows you to connect PBXs into the backbone through voice tie lines directly into the DX voice channel cards. Or, using the trunk channel card, the DX accommodates digital transmission trunks at 2.048 Mbps (G.704/G.732) or 1.544 Mbps (D4/ESF). If Channel Associated Signaling is used, voice channels can be cross-connected to any outgoing network. If Common Channel Signaling is used, voice channels can pass

ıted Networking Solutions

transparently through the network to the remote PBX. You can even connect an analog PBX to a digital PBX using the capabilities of the versatile DX systems.

LAN/WAN

Telematics approach to LAN/WAN connectivity is the most flexible in the industry. It combines the cost effective performance of its Ethernet interfaces and support for the principal router connection protocols with programmable TCP/IP functionality supported on NET25 + + PCP platforms.

This approach enables us to provide standard solutions as well as customized Gateway and internetworking solutions.

ACP Systems

The SmartNet ACP Systems today provide functionality and configurable flexibility for a wide range of protocols including X.25, SNA-QLLC, SNA-VLU, X.3, X.28, X.29 and BSC 3270. Through Telematics WISDOM strategy, ACP platform enhancements will support Frame Relay, LAN/WAN connectivity and ISDN, thus ensuring SmartNet will continue to meet the needs of its customers.

Telematics SmartNet product line is positioned to address a range of networks requiring modest connectivity needs, or networks utilizing a public network service.

SmartNet is based on Telematics ACP line of network and access platforms combined with Smartview, a comprehensive UNIX based network management system. SmartNet delivers a blend of functionality and cost effectiveness that makes it the premier small or entry level data network.

Network Management

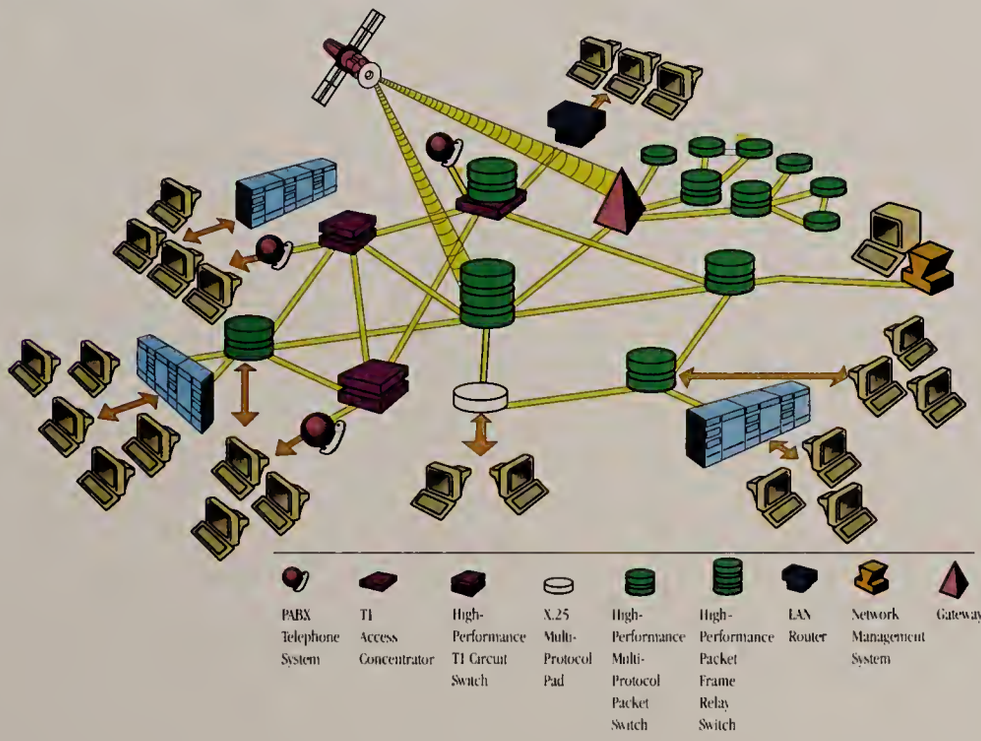
Network Management must be flexible, adaptable, and rich in functionality to provide networking personnel power to manage current as well as future networks. Telematics network management direction can do just that.

Telematics Network Management architecture provides a full function management system, incorporating both menu and graphic driven user interfaces, the means to manage other vendor equipment via our open Product Management Module (PMM) integration interface, plus the flexibility to provide network management information to a host or workstation based enterprise management system, such as AT&T's Acumaster Integrator and B.T.'s Concert workstations.

The promises inherent in the concepts of WISDOM mean that Telematics will be advancing new technologies as they evolve; always maintaining the ability to integrate them into your network and always maintaining flexibility. To us at Telematics, the rising tides of change represent an opportunity. The WISDOM strategy provides the course, and our experience will make the voyage successful. WISDOM...to succeed.

TELEMATICS

The Elements Of Networking



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TELEMATICS

Worth Noting

"End users are much more sophisticated than they were five years ago. They want projects implemented more quickly now because they know what technologies are available. They want to be serviced immediately, and they don't necessarily want to pay more for it."

Charles Murray
Telecommunications director
The Travelers Insurance Co.
Hartford, Conn.

Association Watch

The **Independent T-1 Users Association (ITUA)** will hold a workshop/seminar for members Sept. 23-24 at the San Diego Princess Hotel.

Presentations on the first day will include "Rethinking Your Corporate Network Strategy" and "Migrating Users to the Public Network: Telco and Interexchange Carrier Directions and Plans."

The second day will include presentations on "T-1/T-3 Product Direction for Hybrid Networking" and "Network Management in a Hybrid Environment."

For more information, call (703) 734-7050.

The **Energy Telecommunications and Electrical Association (ENTELEC)** will hold its 1991 Fall Seminar Oct. 24-25 at the Hyatt Regency Hotel in Houston.

The seminar, titled "SCADA — Field Intelligence, Transmission Media, Total System Design" will examine current Supervisory Control and Data Acquisition issues in the energy industry.

The conference costs $95 for ENTELEC members and $150 for nonmembers.

For more information, call (214) 235-0655.

Security weaknesses at U.S. stock markets

Functional area	Stock market No. 1	No. 2	No. 3	No. 4	No. 5
Computer operations			✔	✔	✔
Contingency planning		✔	✔	✔	✔
Disaster recovery	✔	✔	✔		✔
Network management			✔	✔	✔
Physical security			✔	✔	✔
Quality assurance	✔		✔		✔
Risk analysis			✔	✔	✔
Security awareness				✔	
Systems security software				✔	
Systems software management			✔	✔	✔

✔ = Security weaknesses found

The U.S. General Accounting Office recently reported discovering systems security weaknesses at 5 U.S. stock exchanges, which were not named and randomly numbered for security reasons. The National Association of Securities Dealers had no systems security weaknesses.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: U. S. GENERAL ACCOUNTING OFFICE, WASHINGTON, D.C.

Network security lacking at major stock exchanges

GAO cites susceptibility to outages, tampering.

By Wayne Eckerson
Senior Editor

WASHINGTON, D.C. — A federal watchdog agency says the nation's largest stock exchanges lack adequate network and computer security measures, making them vulnerable to outages and data tampering.

The General Accounting Office (GAO) found a total of 68 computer and network security and control problems at five of the nation's six major exchanges during reviews it conducted this past year for the Securities and Exchange Commission.

> The GAO found the greatest problems in contingency planning and disaster recovery.
>
> ▲▲▲

"The lack of adequate controls at the five stock markets could impair their ability to maintain continuous service, protect critical computer equipment and operations, and process correct information," the GAO report said.

The GAO found the most security problems, 24, at the Midwest Stock Exchange, while it reported no problems at the National Association of Securities Dealers. It recorded three problems at the New York Stock Exchange, five at the American Stock Exchange and 18 each at the Pacific Stock Exchange and Philadelphia Stock Exchange.

"With such weaknesses," the report noted, "the markets are vulnerable to risks such as the destruction of equipment, unauthorized data modification and the disruption of services."

A summary of the GAO's findings is contained in a recently issued study titled "Computer Security Controls at Five Stock Exchanges Need Strengthening." The six stock exchanges reviewed by the GAO handle 98% of the stocks traded in the U.S. Those stocks have an estimated value of $1.9 trillion.

Inadequate backup

The GAO examined 10 functional areas affecting information security at the exchanges. These were: network management, computer operations, contingency planning, disaster recovery, physical security, quality assurance, risk analysis, security awareness programs, systems security software and systems software management.

The graphic on this page shows the occurrence of problems in each functional area of the five stock markets with security problems. Although the report identifies the total number of problems at each exchange, it does not detail specific problems at individual exchanges for security reasons. The GAO said it found the greatest problems in the areas of contingency planning and disaster recovery.

The report said four of the stock markets did not have contingency plans outlining the procedures and responsibilities for managing automated systems and trading floor operations during various emergencies. In addition, three of the stock markets didn't have backup computer fa-

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NW User Awards are boon to recipients

Past winners gained credibility, visibility with top management, more confidence in network plans.

By Maureen Molloy
Staff Writer

Past winners of *Network World's* User Excellence Awards said the recognition generated by the award has helped their departments gain greater credibility and visibility with senior management.

They also said the recognition has given them greater confidence in the network plans they have developed and prompted them to explore ways to further maximize network benefits. It has served to speed approval of new networking projects and helped some net executives advance in their careers as well.

"Winning the award heightened our awareness of the network's potential and made us search harder for other ways to take advantage of it," said Steven Davidson, chief of computer operations for Virginia's Prince William County.

Davidson's department was a 1989 User Excellence Award runner-up for its implementation of an integrated data net that provides more than 600 workers with access to a host of different computing environments throughout the county.

"The award solidified our belief that our network has a tremendous underlying capability," he said. "It made us look at how we could tap that capability more fully and achieve even more benefits."

Each year, *Network World's* User Excellence Awards program — now entering its seventh year — honors users for their innovation and expertise in applying network technology. The awards spotlight users whose nets have played a key role in achieving business objectives.

Raymond Pardo, chief telecommunications engineer for Bechtel Group, Inc., said sharing top honors with American Express Travel Related Services Co. in 1988 gave Bechtel's senior management greater faith in his department's strategic plan. But more importantly, he said, it gave his team the impetus to continue pursuing innovative network designs.

"More than anything else, winning the award gave us confidence that we were on the right track and strengthened our re-

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EXECUTIVE BRIEFS

BY WAYNE ECKERSON

Health care recognizes value of EDI. The use of electronic data interchange in the health care industry is expected to grow rapidly in the 1990s as hospitals discover significant cost savings from electronically communicating with suppliers and insurance companies, according to a recent study.

The study, "Electronic Commerce in U.S. Health Care," was published by INPUT, an information services research and consulting firm based in Mountain View, Calif.

The report said the health care industry will increase expenditures on EDI from $800 million today to $2.7 billion by 1996. Hospitals and other health care providers will use EDI primarily to submit insurance claims, receive insurance payments and purchase food supplies.

Already, some hospitals that use EDI have reduced the turnaround time for submitting claims and receiving payments from an average of 80 days to two or three days.

The use of EDI to purchase food supplies will see the greatest growth, expanding from a $2.5 million market today to a $27 million market by 1996. Most food distributors and wholesalers have been using EDI for their transactions with grocery stores and supermarkets for 10 years or more, making it easy for hospitals to implement EDI for their use.

Net security lacking at major exchanges

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cilities, and two didn't have alternate power sources to maintain trading floor operations during a power outage.

However, some stock exchange officials questioned whether it was critical for each exchange to have a backup recovery site or on-site alternate power sources.

Charles Doherty, president of the Midwest Stock Exchange in Chicago, said it isn't necessary for the smaller exchanges to have full recovery capabilities as long as customers could route their orders to an alternate exchange.

"It is asking a lot to expect every exchange to have complete disaster recovery, and I wonder whether that is a good use of funds compared to some of the other things we could be doing," Doherty said.

The American Stock Exchange and the New York Stock Exchange do not have on-site backup generators, primarily because it would cost millions of dollars to retrofit their buildings with such power sources. As a result, these firms have contracted outside firms to haul in generators to supply power in the case of an extended outage.

The GAO report also said three stock markets need to improve the way they manage network operations. Two stock markets use network test equipment that has the capability to alter data as well as monitor it. One stock exchange didn't adequately secure its communications equipment, making it easier for someone to destroy or access the system illegally, the report said.

Trivial pursuits

Some of the demerits the GAO handed out were for relatively insignificant offenses, according to Doherty. One such example, he said, was the agency's citing of the Midwest Stock Exchange for providing a brochure in its visitors' gallery that shows the location of a guard post inside the exchange. The GAO said the brochure could be used as a road map by someone who wanted to damage the exchange's computer or network equipment.

The GAO also recommended that the Midwest Stock Exchange install metal detectors at its entrances. Doherty said this would drastically alter the character of the exchange. "When they got down to trivia, they got pretty trivial," he said.

However, Doherty added that the Midwest Stock Exchange has corrected all of the problems mentioned by the GAO report when it was cost-effective to do so. It has discussed the areas it has not addressed with the Securities and Exchange Commission.

Vendor to announce E-net/token-ring set

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ferentiating factors between ChipsLAN and TI's token-ring chipset is the ability to support built-in management capabilities.

Firoozmand said most chipsets have a CPU. The CPU in the TI chipset is proprietary, while the ChipsLAN CPU is based on the Intel Corp. 8086 microprocessor. Because the chip is based on a nonproprietary design, vendors will find it easier to build value-added features such as inherent management functions directly into their products. For example, vendors will be able to include a Simple Network Management Protocol agent in the hardware rather than having to add the capability through software. "The key here is that these chipsets are easily customizable," Firoozmand said.

Intel offers bevy of LAN products

continued from page 21

instead relies on its SoftSet software program to automatically determine the best configuration for the board with regard to interrupt request lines, use in eight- or 16-bit slots and bus timing parameters.

Intel also introduced the $795 EtherExpress32 LAN Adapter, a 32-bit card for servers that are based on the Extended Industry Standard Architecture (EISA) bus.

In addition, Intel is offering the $149 External Ethernet Twisted Pair Transceiver, which enables a coaxial Ethernet card to support 10base-T unshielded twisted-pair wiring.

Although Intel will now be competing with some of the manufacturers to which it sells Ethernet chipsets, Flach said that will not be an issue because Intel is not the only supplier of those chips.

For the token-ring arena, Intel launched the TokenExpress ISA 16/4 LAN Adapter and TokenExpress MCA 16/4 LAN Adapter, both priced at $695, as well as the TokenExpress EISA 16/4 LAN Adapter, priced at $895. All the products support both 4M and 16M bit/sec speeds and are based on token-ring chipsets from Olicom A/S of Denmark.

In order to boost performance, the TokenExpress cards offer 128K bytes of onboard memory, bus master technology and host-based processing of selected protocols.

Intel claims it has done extensive testing of its token-ring boards and can ensure compatibility with more than 85 hardware and software components from IBM, Microsoft Corp., Novell, Inc. and other vendors.

The TokenExpress line also includes a $95 external media filter, which enables a shielded twisted-pair token-ring interface to support unshielded twisted-pair wiring.

Both the EtherExpress and TokenExpress LAN adapters will be available later this month.

In the area of network management, Intel announced a family of monitoring and analysis software and hardware tools that upgrade a personal computer into a network analyzer or monitor.

Intel's NetSight Sentry, consisting of software and an intelligent add-in board, turns a microcomputer into a network monitor for Ethernet and token-ring networks, and displays statistics such as network traffic and faults. The NetSight Sentry for Ethernet costs $1,995, while the token-ring version costs $2,995.

The NetSight Professional, a high-end diagnostic tool consisting of software and an intelligent add-in board, offers on-line monitoring and seven-layer protocol decoding and analysis. It is priced at $7,995 for the Ethernet version and $8,995 for the token-ring version.

LANSight Support 2.0, an enhanced version of LANSight 2.0, is a Microsoft Windows-based tool that can be used for simple management of Novell NetWare LANs, enabling users to diagnose problems and configure remote devices. LANSight Support is priced at $395, with upgrades priced at $95.

These products are scheduled to be available this fall.

As part of the announcements, Intel also unveiled two software products designed to allow users to send facsimiles from LAN-based personal computers.

The first product is NET SatisFAXtion fax server software, which enables users to send and receive faxes from any DOS or Windows application. NET SatisFAXtion costs $799 per fax server license, while the accompanying board needed in the server costs $499. The version for NetWare will be available this month with all other network versions available in January 1992.

In addition, the company announced LANSpool FAX, a software add-in module that adds outbound fax capabilities to the LANSpool 3.0 print server. New features in LANSpool 3.0 include full support of Windows, increased speed, a suite of LAN diagnostic printing tools and the LANQview queue management system.

Both LANSpool FAX and LANSpool 3.0 will be available October 1. LANSpool FAX software is priced at $295, and LANSpool 3.0 at $395 for NetWare 2.x and $595 for NetWare 3.x.

NW User Awards are boon to recipients

continued from page 23

solve to keep working for open systems," Pardo said.

Bechtel, one of the world's largest construction firms, is moving toward a vision of worldwide information systems interoperability. The company is working to give its clients and more than 10,000 suppliers immediate access to project information and to allow its engineers to work on jobs in different continents without leaving their offices.

"We now have interconnection between most of our systems and numerous applications running across the network," he said. "Having been championed with the award has helped us continue pursuing our goal of using the network as the basis for distributed processing."

Winning has also conferred even more tangible benefits on some users. William Spies, divisional vice-president of First National Bank of Maryland, has witnessed speedier approval of new, more sophisticated network projects since his group won the award last year.

"The award has contributed to our credibility and allowed us to get projects approved by top management far more easily," Spies said.

Larry Ehlers, former telecommunications manager at the Olathe, Kan., Bendix/King, has parlayed the recognition he gained as a User Excellence Award runner-up two years ago into a job as an independent videoconferencing consultant.

Bendix/King, a division of Allied-Signal Aerospace Co., was recognized for using videoconferencing for real-time, day-to-day communications among company engineers and customers. That strategy significantly cut product development time and travel expenses for the manufacturer of aircraft radios and flight instruments.

Ehlers credits the award with propelling him into a position of "videoconferencing guru." Since winning the award, he has been asked to assist other divisions of Allied-Signal in implementing videoconferencing networks. He was also elected to the board of directors at the International Videoconferencing Association user group in Washington, D.C. In addition, Ehlers was hired as a consultant by Kansas' Department of Education to help develop a statewide videoconferencing program.

"The award definitely had a big, positive impact on my career," Ehlers said. "I wouldn't have been doing what I'm doing now without the recognition that began with winning the award."

Worth Noting

About 45% of the three trillion characters per month routed over France Telecom's Transpac public packet-switching network are for Minitel videotex services, according to Gerard Simonet, Transpac Network Services, Ltd.'s director general. He added that videotex services account for about 20% of Transpac's four billion francs ($678 million U.S.) in revenue.

World News

Scientific-Atlanta, Inc. last week announced plans to begin offering its first shared-hub very small aperture terminal satellite service in Canada. The Atlanta-based satellite vendor said its $1.5 million shared-hub earth station in Scarborough, Ontario, will come on-line in November.

The shared hub will support communications with remote VSAT earth stations on user premises throughout Canada. Scientific-Atlanta says it will provide VSAT services for $450 to $650 Canadian dollars ($400 to $575 U.S.) per node, including equipment, maintenance, service and installation charges.

The anchor customer of the hub will be Volkswagen, AG's Canadian unit, Volkswagen Canada, Inc., which expects to use the hub to communicate with VSATs at nearly 190 dealerships and parts depots.

John Russell, Scientific-Atlanta's marketing manager for private networks, said there are probably about 100 sites in Canada with VSATs, compared with about 45,000 in the U.S. He said VSAT usage in Canada has been low because the cost difference between satellite and terrestrial services has been small.

AT&T EasyLink establishes international EDI services

Subscribers gain access to Istel's Edict services.

By Barton Crockett
Senior Editor

LONDON — AT&T's EasyLink Services unit said it has finished integrating the electronic data interchange services offered by Istel, Ltd., a value-added service provider AT&T acquired in 1989, with the rest of its EDI services.

Now subscribers to AT&T's EDI offering will be able to take advantage of capabilities supported by Istel's Edict line of EDI services and vice versa.

For example, the Edict service supports the translation of EDI documents into EDI formats unique to the U.K., such as the Odette standard widely used in the U.K. automobile industry. Likewise, Edict users in the U.K. will now be able to use features of AT&T's EDI service, such as the conversion of EDI documents into facsimile or telex messages.

"The full functionality of each offering is now available to users of both services," said Pamela Harman, director of marketing and business development for AT&T EasyLink Services in the U.K. and Europe.

AT&T introduced its EDI service in the U.S. in 1988. Edict was launched by Istel in the U.K. in 1985. Istel is now called AT&T Istel and is part of AT&T's EasyLink Services division, the carrier's value-added service unit.

Boon to Edict users

The merger is particularly beneficial for Edict users because it greatly expands the number of nodes from which they can access Edict services. Previously, Edict was only available from about a dozen synchronous access nodes operated by Istel in the U.K.

These synchronous access nodes were on Istel's U.K.-based Infotracs network, which the company used to deliver a wide range of value-added services, including EDI and videotex. The Infotracs network also contained another 80 asynchronous access nodes in the U.K., but users couldn't access Edict services through these nodes.

Now subscribers can access Edict through the asynchronous nodes. Transmissions can be routed through those nodes to processors here that handle AT&T's EDI service — which supports asynchronous access —

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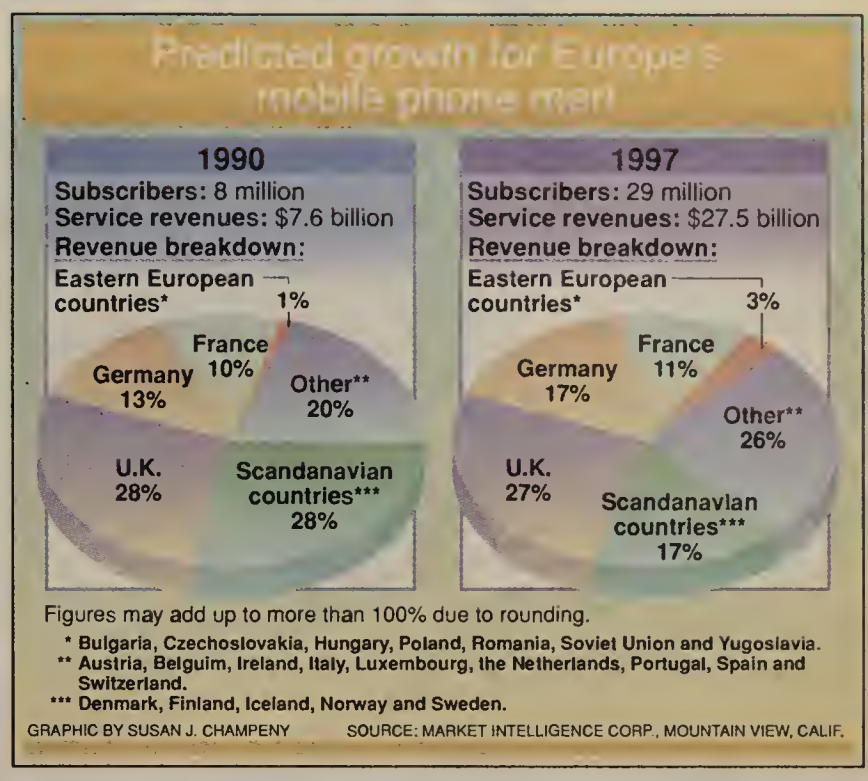

Figures may add up to more than 100% due to rounding.

* Bulgaria, Czechoslovakia, Hungary, Poland, Romania, Soviet Union and Yugoslavia.
** Austria, Belguim, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain and Switzerland.
*** Denmark, Finland, Iceland, Norway and Sweden.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: MARKET INTELLIGENCE CORP., MOUNTAIN VIEW, CALIF.

Carrier plans for future in value-added services

By Barton Crockett
Senior Editor

PARIS — A top official of France Telecom's public packet-switching service provider recently said the carrier plans to set up value-added service providers across Europe over the next few years to effectively serve users in the emerging common market.

Establishing a stronger pan-European presence will also make France Telecom a stronger competitor throughout the continent, according to Gerard Simonet, director general of Transpac Network Services, Ltd., the public packet-switching unit.

"Our ambition is to be one of the top European [value-added] networks," Simonet said.

France Telecom moved earlier this year to establish its first value-added service operation outside of France when the carrier's Transpac unit agreed to take over the private net of London Regional Transport Co., a transportation firm in London ("France Telecom pierces U.K.'s X.25 data market," *NW,* June 24). France Telecom plans to run the network for the user and to use it to sell value-added services in the U.K.

Simonet said France Telecom plans to further expand by buying a value-added service provider in another European country this year. He declined to name the targeted country.

If the carrier cannot find an acceptable value-added service provider to acquire, it will acquire user networks to provide the services. "It does not have to be an operator [that we buy]," Simonet said. "It can be an organization with its own private network that is interested in selling that network to a company to resell services to third parties."

According to Simonet, Transpac already carries more traffic than any other value-added network provider in the world. He said Transpac has more than 100,000 subscribers sending three trillion characters of traffic per month — five times the num-

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European carriers put MANs on trial

QPSX pushes concept of high-speed regional nets as basis for new public, private services.

By Timothy O'Brien
West Coast Bureau Chief

PERTH, Australia — A little-known company here is taking Europe by storm, setting up technology trials in 10 countries with carriers and major vendors in order to test an emerging metropolitan-area network technology that could serve as the basis for new public and private network services.

The company, QPSX Communications, Ltd., said its metropolitan-area network products could do for regional data transmission services in Europe what Switched Multimegabit Data Services (SMDS) promise to do for users in the U.S.

Metropolitan-area nets generally serve areas about 30 miles in radius and transmit data at up to 200M bit/sec, although QPSX's technology supports data rates of up to 140M bit/sec.

Already, carriers and other potential service providers are trialing QPSX products in Austria, Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden and Switzerland.

In addition, Kopenhagen Telecom AS (KTAS), a Danish carrier, earlier this year began offering Europe's first metropolitan-area network service based on QPSX gear.

"In a couple of years, the type of service that KTAS is now offering will be widespread in Europe," said Steven Timms, principal consultant with Ovum, Ltd., a consulting firm in London. "QPSX technology will be the European counterpart to what AT&T's SMDS will be in the U.S."

Although the bulk of interest in QPSX has been in Europe where SMDS services are not available, other significant trials of QPSX equipment are being conducted at Telecom Australia as well as Bell Atlantic Corp. and US West, Inc.

The QPSX technology, named for queued packet and synchronous exchange, allows local-area networks to transmit data, voice, and video at very high speeds over long distances using public data networks.

In the trials, QPSX provides switching equipment that essentially consists of a hardware unit with a mix of interfaces on the wide-area side and an equally diverse mix of LAN and other data terminal equipment interfaces on the customer premises side.

On the LAN side, QPSX equipment supports many standards and protocols including IEEE 802.3 Ethernet, IEEE 802.5 Token Ring, Transmission Control Protocol/Internet Protocol, Fiber Distributed Data Interface and others, making services supported by the products suitable for LAN interconnection, as well as videoconferencing and other high-bandwidth applications.

QPSX was formed in early 1987 as a joint venture between Telecom Australia, the University of Western Australia and a six-member team of engineers, which developed the technology under a Telecom Australia grant.

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Application backlogs.

If development's at a stand

In two or three years your company will have changed, your markets will be different, your competitors will be using new tactics, and the applications you needed today might be ready.

So it goes with software development. Most large projects are backed up so long, by the time an application is new, it's old. Worse, it may not even be what was asked for in the first place.

This dilemma is anything but acceptable, so IBM has launched a major effort to speed things up. Working with leaders in CASE technology, we're building a new framework called AD/Cycle™ that's giving the entire development cycle something it never had before;

still, how fast can the rest of your business go?

uniform standards for streamlining the process from start to finish.

AD/Cycle also includes a host of new tools, both from IBM and our business partners: CASE tools for planning, analysis and design, languages, generators, plus testing and maintenance tools, all with a structure for coordinating their efforts.

And to help executives and programmers think more alike, AD/Cycle offers advanced methods for sharing information so that everyone can work on the same wavelength, so the end product will be right.

Over 60 AD/Cycle products are available today, and scores of CASE vendors have signed up for AD/Cycle. Which means it's already gaining acceptance as a standard for application development, and much more is on the way.

Companies like Eastman Kodak, Phillips Petroleum, USAA and Continuum are now using AD/Cycle tools with good results. Clearly, the sooner you get started the better, and there's plenty to start with now.

The roots of today's backlogs are many, but the biggest culprits have been a lack of standards and direction—the very ills that AD/Cycle is designed to cure.

For more information about our growing family of AD/Cycle products call 1 800 IBM-CALL, ext. 822.

IBM®

European carriers put MANs on trial

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Timms said QPSX must convince carriers and other service providers to invest in the network infrastructure needed to support metropolitan-area nets before the technology has a chance of widespread availability.

"The real problem with the whole broadband communication area is the lack of optical links to convey the high bandwidth to users," he said. "There has been more progress in this area in the U.S. than in Europe."

In an effort to penetrate the European market, QPSX teamed up with Siemens AG and Alcatel Network Systems Corp. two years ago for manufacturing and distribution of its products outside of Australia and designated Asian markets.

Those arrangements have paid off handsomely for QPSX, resulting in a series of network trials across Europe. The KTAS deal, the full value of which has not been disclosed, was handled by Seimens. KTAS said it has signed on a major user, Novo Nordisk AS, a multinational pharmaceutical supplier, to provide high-speed interconnection of the user's scientific and administrative networks.

The KTAS network conforms to the IEEE 802.6 standard for metropolitan-area nets and supports a transmission rate of 34M bit/sec.

Another Seimens customer scheduled to begin offering a service this month is SIP, the Italian Communications Research Institute. SIP plans to operate a public high-speed data network based on QPSX technology on a trial basis in Turin, Italy. The SIP network initially will link LANs at two universities, a regional data processing facility and several corporations at speeds of 34M to 140M bit/sec.

According to QPSX Managing Director Peter Abery, the vendor has even succeeded in placing its equipment in its home market. Telecom Australia recently accepted QPSX's metropolitan-area net equipment as the basis for a new commercial service following a six-month pilot program.

EasyLink establishes int'l EDI services

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then passed over to processors that handle Edict transactions.

Nearly all Edict subscribers are in the U.K.

U.S. users can now access Edict services by dialing into AT&T messaging nodes in the U.S., whereas they previously could only gain access via Infotracs nodes in the U.K.

AT&T also earlier this month announced a new pricing strategy for Edict services. In the past, users had to pay a flat monthly fee that included charges for consulting, document translation and other services.

Now AT&T has unbundled its charges and is levying volume-sensitive charges for Edict services that mirror the volume-sensitive tariffs for AT&T EDI offerings. This makes Edict less expensive for low-volume users.

The new Edict service charges are 10 pence (17 cents U.S.) per 1,000 characters, with a minimum charge of £50 ($86.50 U.S.) per month for users with asynchronous dial-up access. Users are also levied separate, onetime service establishment, document translation and consulting fees.

The new pricing means that Edict users with dial-up access in the U.K. will pay only a few hundred dollars per year for the service, compared with several thousand dollars annually under the old system, Harman said. She added that high-volume Edict subscribers probably will not see any change in their bills.

Carrier plans for value-added services

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ber of characters transmitted over US Sprint Communications Co.'s SprintNet network. Transpac's revenues totaled about four billion French francs ($678 million U.S.) last year.

Simonet said France Telecom expanded first into the U.K. because it has the continent's most liberal regulatory environment. He added that Germany and Sweden also allow full competition in value-added services.

Simonet said France is moving to allow greater value-added service competition. Meanwhile, such competition is not currently allowed in Belgium, Italy or Spain. International value-added service providers can open one or two international gateway nodes in those countries but are not allowed to set up extensive domestic operations, he explained.

However, these restrictions should weaken as the European Community moves forward with plans to allow value-added service competition in each of its member countries by the end of 1992.

As France Telecom expands internationally, Simonet said it will not end its relationship with Infonet Services Corp., an international value-added network (IVAN) operator based in El Segundo, Calif.

France Telecom owns 16% of Infonet and relies on the IVAN to carry much of the international traffic originating in France. Simonet said the new value-added service companies that France Telecom will establish in Europe will focus on serving domestic markets and will rely on Infonet for international services.

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

First Look

Computer Logics bolsters LinkUp 3270 LAN Gateway

Computer Logics, Ltd. recently announced an enhanced version of its **LinkUp 3270 LAN Gateway** that includes a more powerful file transfer facility, token-ring local-area network support and increased session support.

Version 5.02 of the gateway software resides in IBM Personal Computers or Personal System/2s on a LAN, enabling them to support multiple 3270 terminal-emulation sessions from DOS-based devices on a LAN to an IBM host.

The new file transfer mechanism, called LinkUp File Transfer Executive Utility (FTEXEC), performs file transfer 50% to 100% faster than the previous unnamed facility. The previous version could transfer a 151K-byte file in 46.5 seconds, whereas FTEXEC can handle the same task in 39.99 seconds at standard speed and 14.72 seconds in the high-speed mode, the vendor said.

The addition of token-ring support allows the gateway to provide a token-ring connection to a host computer using the IEEE 802.2 Logical Link Control protocol to route data through a token-ring adapter in a personal computer across the LAN to the gateway. The data is then passed to an IBM front-end processor with a Token-Ring Interface Coupler or a 3X74 controller with Token-way support. The front-end processor or controller then passes the data to the host. Likewise, a 3X74 cluster controller can be attached to the token ring and pass 3270 traffic to the host via the gateway.

Lastly, the company increased the number of mainframe sessions the gateway software can support from 64 to 253. All 253 sessions can be handled concurrently when using a token-ring adapter, according to the company.

Pricing for the LinkUp 3270 LAN Gateway Version 5.02 ranges from $650 for a version that supports five 3270 sessions to $6,925 for a version that supports 253 sessions. The software and its upgrades are available now.

Computer Logics Ltd., 31200 Carter St., Solon, Ohio 44139; (216) 349-8600.

Wollongong offers VAX NFS package

By Joanne Cummings
Staff Writer

PALO ALTO, Calif. — The Wollongong Group, Inc. last week announced software that enables LAN-based workstations attached to a Digital Equipment Corp. VAX to access files located on any Unix-based system on the net that supports Sun Microsystems, Inc.'s Network File System (NFS).

The software also allows a network manager to back up local and remote NFS servers to a VAX's high-capacity disk and tape drives, thereby providing one central archive site for a company's network.

The product, called PathWay Client NFS for VMS 2.0, resides on a VAX and is actually the first release of the software, the vendor said.

According to Herbert Martin, president of The Wollongong Group, the software provides users with a VMS user interface to access NFS files on other systems. File naming differences between applications or files residing in VMS and Unix environments are automatically negotiated by the software.

PathWay Client NFS for VMS 2.0 supports all VMS Record Management Services, file attributes and record formats. Thus, it enables VMS users viewing Unix files to see traditional VMS file formats.

According to Ed Alcoff, the company's product marketing manager, one limitation of the software is that when it is used in a DEC DECnet environment with an NFS server, it does not support straight VMS-to-VMS file transfers.

He added that an upcoming release will remedy that shortcoming.

PathWay Client NFS 2.0 must run in tandem with Wollongong Integrated Networking/TCP for VMS Release 5.1 or later and VMS 5.1 or higher.

Under a pricing promotion extending to Feb. 29, the software will cost $1,000 to $5,000, depending on the VAX host.

After that date, the product will be priced between $1,000 and $11,000, depending on the VAX host. The software is available now.

For more information, contact The Wollongong Group at 1129 San Antonio Road, Palo Alto, Calif. 94303, or call (415) 962-7100.

RAD Data unveils low-end remote Ethernet bridge

By Joanne Cummings
Staff Writer

ROCHELLE PARK, N.J. — RAD Data Communications recently announced the MBE, a low-end transparent bridge that connects an Ethernet local-area network to a remote Ethernet supporting as many as eight workstations.

The MBE is a two-port standalone device that differs from traditional LAN bridges because memory constraints only allow it to support eight workstations or servers at the remote site.

The offering works like a media access control-layer remote bridge, operating transparent to high-level network protocols. It also performs filtering and forwarding of only those packets destined for the remote site. But unlike regular bridges, filtering and forwarding is not identical in the local and remote MBEs.

The remote MBE is self-learning; therefore, it recognizes the addresses of all devices attached to it and transmits only those packets destined for the central site; it does not filter packets.

The MBE at the central site filters incoming traffic from the remote site and forwards only those packets with remote site destination addresses.

The product comes with an Ethernet port that connects the LAN to the unit via traditional Ethernet coaxial cabling, 10Base-2 thin-wire Ethernet or 10Base-T unshielded twisted-pair wiring.

The unit also has a single wide-area network port that links the Ethernet to a single dedicated or switched line supporting transmission speeds up to 256K bit/sec. The wide-area port supports V.35, V.24/RS-232, X.21, V.36/RS-422 or RS-530 links.

The MBE is available in two models. The MBE-1, which links a single remote workstation to a central Ethernet, is priced between $800 and $1,100, depending on the WAN interface used. The MBE-8, which links an Ethernet of eight workstations to a primary LAN, is priced from $1,400 to $1,700.

For more information, contact RAD Data Communications at 151 W. Passaic St., Rochelle Park, N.J. 07662; (201) 587-8822.

Verilink packs data, voice onto T-1 pipe

New Access System 2000 reduces line costs by consolidating traffic onto a single dedicated line.

SAN JOSE, Calif. — Verilink Corp. last week announced a multiport data service unit/channel service unit (DSU/CSU) with T-1 and subrate multiplexing capabilities that enables users to consolidate traffic from multiple voice and data lines onto a channelized T-1, thereby reducing line costs.

The Access System 2000 is based on a unique Advanced Programmable Architecture design that enables it to be reprogrammed to adapt to new standards and carrier services, such as emerging high-bandwidth switched services, as they become available.

"The thing that attracts us most to this product is the flexibility of its software-definable design," said Tom Calabrese, assistant director/engineering consultant with The Travelers Insurance Co. in Hartford, Conn., which beta-tested the product. "It gives us the ability to use the product one way today and another way tomorrow, thus prolonging its life."

The Access System 2000 is a modular system that sits between carrier services and a customer's network equipment, such as a private branch exchange or local-area network router.

Initially, Verilink will offer a two and 13-slot model, each of which which houses modules that link customer premises equipment to the device as well as connects the unit to one or more T-1 line.

The system modules are interconnected by a backplane that operates at the 1.544M bit/sec T-1 speed, but the vendor said it will eventually be upgraded to support Synchronous Optical Network speeds.

The company will offer a two-port carrier access module for the Access System 2000 that provides one port to a T-1 line and a second to link on-site PBXs or channel banks with a T-1 output to the unit in order to piggyback voice onto the dedicated T-1.

The vendor will also offer high-speed two-port modules that link local devices operating at 56K or 64K bit/sec to the Access System 2000 chassis and five-port subrate modules that support devices transmitting data from 9.6K to 56K bit/sec.

"What that does is give the user the flexibility to use the T-1 in any way he sees fit," said Kris Sowolla, director of customer premises equipment marketing.

Sowolla said the product's most significant feature is its Advanced Programmable Architecture. The Access System 2000 employs a number of custom programmable gate array circuits that let users adapt the device to changes in transmission standards or carrier services without obsoleting the equipment.

"What we'll be able to do is provide a software interface to new high-speed switched services, so instead of trading out existing gear, a user could reprogram the Access System 2000 to support those services on a switched basis rather than via dedicated T-1s," he said.

By contrast, most DSU/CSUs use hard-coded application-specific integrated circuits to support a specific T-1 framing format or carrier service transmission format. That type of design limits equipment to a singular use. This means it can not be reprogrammed for other purposes as network needs evolve.

The Access System 2000's design will be particularly helpful to customers as carriers roll out high-speed switched services, such as switched 384 or switched T-1. Although Sowolla made it clear that the Access System 2000 will not support those services initially, he stressed it is the company's intention to eventually provide an interface to them. He declined to specify the carriers Verilink is working to support but said it would make further announcements at the Tele-Communications Association, Inc.'s annual conference in San Diego later this month.

"What we're saying is to deploy the gear today with the ability to eventually change the device by acquiring a software upgrade from us and extra processing capability to handle the signaling part of it," he said.

Pricing for the Access System 2000 ranges from $5,000 for a two-slot unit with one T-1 interface to the public network and one high-speed access module with two ports, to $17,000 for a fully configured 17-slot system. The Access Systems 2000 module is available now.

For further information, contact Verilink at 145 Baytech Drive, San Jose, Calif. 95134, or call (408) 945-1199.

OPINIONS

LEGAL ISSUES

BY JAMES JOHNSTON

Congress needs to reexamine copyright law

Vexing legal issues surrounding the use of copyrighted CDROMs — particularly on a network — may make books on disk so expensive as to kill the market for them.

Under current law, copyright owners have certain exclusive rights, including the right to make copies and the right to perform the work publicly, such as by reading it on the radio. Thus, the purchaser of a copyrighted book may *not* copy it or perform it publicly.

Applying this law to the use of copyrighted data bases on nets produces surprising results. First, each time a user accesses the CDROM, a "copying" occurs, as data on the compact disk is transferred to computer memory and then to the screen. Copyright law considers this an unauthorized copying, similar to photocopying a book or magazine.

> Without the net, users would have to purchase individual CDROM data bases.
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The law expressly permits this sort of copying of computer programs since it is essential to their use. However, it is uncertain whether copyrighted data on CDROM fits the law's definition of a computer program.

Second, any user who selects material from CDROM and either copies it to disk or prints it engages in unauthorized copying. The law does permit limited copying as "fair use." Copying may qualify as fair use if it does not affect the potential market for or value of the copyright.

Networking a CDROM is different. Without the network, users would have to purchase their own individual CDROM data bases. Thus, network use may diminish the potential market for the copyrighted data base and not be considered a fair use.

Third, under the law, the sequential, individual viewing of copyrighted material by a substantial number of people over a local-area network fits the definition of a public performance.

Fourth, the sharing of a copyrighted data base that occurs on a network is permitted by the first sale doctrine, which allows the purchaser to dispose of the data base by reselling, leasing or lending it. But sharing or leasing computer programs for commercial advantage is excluded from the first sale doctrine to stop piracy schemes. If it is found that CDROM material meets the definition of a computer program, then networking the material may well be infringement since it is a sharing or lending for commercial advantage.

To protect themselves from infringement claims, purchasers of copyrighted CDROM data bases will want licenses to permit the copying, public performances and renting or lending that occurs in the network environment.

But licenses do not give complete protection. For example, if the CDROM covered a periodical collection, each periodical would be copyrighted by its publisher, each article would be copyrighted by its author, and the entire collection would be copyrighted by the CDROM vendor. With this many copyrights involved, the CDROM vendor might be authorized only to reproduce the material on CDROM but not to license further copying or public performances.

Unless copyright law is changed, CDROMs seem destined to follow the unfortunate pattern established by computer software and be marketed only with licenses, which usually means higher prices. Congress may need to reexamine current copyright law to avoid this result and keep the information age affordable.

Johnston practices communications and copyright law in Washington, D.C.

EDITORIAL

Demystifying the cult of client/server computing

These days, just about every vendor is staking claim to the territory of client/server computing. But despite all the hubbub, it isn't clear that everyone is talking about the same thing. In fact, different camps are putting their own spin on client/server in the hopes of shaping your thinking to their advantage.

Client/server computing is really quite simple. Before spelling out what it is, it helps to understand what it is not.

Client/server is neither a product nor a set of products or services from any one supplier. It's not something you buy or a credo to which you must make a religious conversion. Nor is it a revolution. Rather, it's a logical evolution, the next step in the way computer and network technologies are applied.

Put simply, client/server is a computing architecture in which any device in a network can request information or processing services from any other. When a device is asking for data or processing power, it's a client. When it's supplying information or services, it's a server.

Client/server makes sense because it helps companies maximize their extensive investments in processing power — from the desktop to the midrange to the data center.

But client/server only makes sense if it makes sense for you. It isn't appropriate for all applications, and it won't be feasible for many others for years to come.

What's driving the shift to client/server computing? A number of factors, the most important being networks, standards and the tremendous power and versatility of today's desktop devices.

But no single vendor can supply all the pieces to make client/server computing a reality in your organization. Beware of suppliers that claim to have it all. A good test of how well a vendor is positioned to meet your client/server needs is to examine how open that company's product line is. Open computing, software and network tools are the plug-and-play components that are the foundation of client/server architecture.

If you need more information on client/server computing, we suggest you contact the members of the fledgling Client Server Industry Forum by calling its acting chairman, Arun Gupta of DataEase International, at (203) 374-8000.

And stay with *Network World*. Our mission has always been to give you information on all the components — the standards, applications, distributed data bases, development tools, network equipment and software — that make client/server work, without the hype. That mission isn't going to change.

OPINIONS

REGULATORY AFFAIRS

BY ALAN PEARCE

Dean Burch: The industry owes him a debt of gratitude

It is ironic that former Federal Communications Commission Chairman Dean Burch died within days of U.S. District Court Judge Harold Greene's most recent blistering attack on the so-called ineffectiveness of the agency.

Clearly, Greene has not bothered to look at the industry-shaking policies promoted by Burch's FCC in the 1970s — policies that have totally reshaped the structure of the telecommunications industry, given countless business opportunities to new entrants and, most importantly, empowered the user community.

Greene has never been convinced that the FCC could do its job properly in spite of the growing body of evidence to the contrary. He has said repeatedly that the commission was unsuccessful in detecting and prohibiting the Bell System's anticompetitive and illegal conduct before divestiture in 1984.

According to Greene, there is no reason to believe that the commission is any more effective today than it was in the 1960s and 1970s.

This kind of attack is an affront to the memory of Burch, who was chairman of the FCC from 1969 to 1974.

"Dean Burch's tenure at the FCC marked the beginning of the procompetitive, deregulatory era in the telecommunications industry," says Richard Wiley, who was Burch's general counsel and later his successor as FCC chairman.

"With his exceedingly agile mind and keen instincts," he continues, "Dean was open to new concepts and structures that ultimately changed the face of communications policy and regulation in this country — and the world."

A quick look at the record proves Wiley right and Greene wrong. Under Burch's leadership, the FCC — in rapid order — allowed MCI Communications Corp. to begin long-haul services in competition with AT&T, launched the domestic satellite policy, crafted the First Computer Inquiry policy governing the early convergence of computers and communications, initiated registration rules for customer-provided equipment and unleashed value-added carriers.

> "Dean Burch's tenure at the FCC marked the beginning of the deregulatory era in the telecommunications industry."
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And that's not all. Judge Greene may be interested to know that Burch pursued an investigation into Western Electric Co., an inquiry that ultimately led to the filing of the antitrust suit against AT&T in 1974.

Burch, in fact, concluded that Ma Bell was foreclosing equipment competition in clear violation of antitrust laws.

He also prodded AT&T into expanding the capacity of undersea cables for the provision of rapidly growing voice and data traffic across the North Atlantic.

MCI Chairman Bill McGowan readily acknowledges his company's debt to Burch.

He has said repeatedly that MCI would not be the power in long-haul telecommunications services that it is today without the policies that were vigorously pursued and adopted by the commission under Burch.

The same is true of competitive equipment manufacturers, cable television companies, backyard satellite dish owners and the providers of a myriad of information and value-added services.

In addition, the policies Burch initiated are now being copied overseas. The European Community, for example, is adopting competitive customer premises equipment policies and domestic and regional satellite proposals similar to those that Burch implemented more than 20 years ago.

Burch's career in telecommunications policy did not end in March 1974, when he left the FCC and became counselor to President Nixon.

Both President Reagan and then Vice-President Bush helped install Burch as director general of the International Telecommunication Satellite Organization in 1987. He then moved INTELSAT into a new age of increasingly sophisticated, user-friendly and significantly less expensive global networks.

In everything he did, Burch was motivated by a desire to give more power to the user. His policies were designed to foster competition and improve regulation while protecting and empowering users.

Almost everyone connected with the telecommunications industry today owes Dean Burch a debt of thanks.

But he would never have demanded or even expected it. He was always modest about his accomplishments and never bragged or boasted.

I owe Burch more than most people. Not only was he my first boss in the U.S., he was also my mentor, my counselor, my sponsor for citizenship and my friend.

I will miss Burch. I salute him for adopting policies that have shaken up an important industry and made it much more user-friendly than it was when he first came to know it.

Pearce, who is president of Information Age Economics, Inc., a telecommunications research firm in Washington, D.C., was Dean Burch's special assistant and chief economist at the Federal Communications Commission.

LIKE ALLIGATORS IN A SWAMP, unforeseen problems can really put the bite on a communications operation. Many managers find themselves wrestling with these networking reptiles every day.

If you've survived an "alligator attack," share it with our readers by calling Susan Collins, associate features editor, at (508) 820-7413 or fax your idea to us at (508) 820-3467. Alligators should be 1,200 words in length and submitted either on disk or via modem.

TELETOONS

BY FRANK AND TROISE

LETTERS

The terms of SNMP

Edwin Mier's review of Simple Network Management Protocol (SNMP) hub agents ("*NW*/Bell Labs tests show SNMP hub standards lag," *NW,* Aug. 19) contained several inaccuracies that may mislead readers. In particular:

■ The assumption that "the hub/concentrator needed, at a miminum, to implement . . . some of the Interface group on a port-by-port basis" is incorrect.

Although he states that "we saw no reason why the Interface group of standard objects could not be used effectively to represent and manage ports on a hub," there is a general consensus in the SNMP community that Ethernet repeater ports are *not* interfaces for the purposes of Management Information Bases (MIB) I and II.

Moreover, the information supplied by the Interface group is not specific enough to Ethernet to be useful in troubleshooting physical-layer problems. Therefore, effective management of Ethernet repeaters using this group is not possible.

■ Including one FDDI concentrator in the survey along with nine Ethernet hubs suggests that the author misunderstood the network management issues of these two different kinds of local-area networks. Comparing them in the same survey is like comparing apples and oranges.

■ The difficulties the testers encountered with duplicate variable names in vendor-specific MIBs point to a problem with the management stations, not the MIBs. Each variable defined in a MIB has a unique name when fully qualified. The MIB compilers should resolve variable references via that fully qualified name.

(continued on page 46)

Network World *welcomes letters from its readers.*

Letters should be typed and double-spaced. Mail them to Editor, Network World, *161 Worcester Road, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

ISDN Plug n' Play

Now you can have instant compatibility to 5ESS or DMS-100 central offices.

By simply plugging in Fujitsu's feature cartridge, now anyone can make our SRS®-2000 digital phone set compatible to 5ESS® or DMS™-100 Basic Rate Interface.

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Fujitsu's full line of desktop ISDN products, including the SRS-400/410 Terminal Adapter and SRS-1050 digital set, feature the replaceable cartridge and support the V.120 rate adaption standard to put you on a path towards an open ISDN architecture.

World class products with advanced features like these are the result of 10 years of practical ISDN experience and over 50 years of telecommunication experience that only Fujitsu, a $20 billion global company can deliver.

For more information on Fujitsu's ISDN Plug n' Play desktop products call Fujitsu Network Switching at 800-228-ISDN.

FUJITSU

The global computer & communications company.

Welcome to the work group of the future

CONTINUED FROM PAGE 1

age files), to videoconferencing that supports two-way transmission of documents, images and sounds.

More broadly, the term groupware is used to define software that increases the productivity of microcomputer users linked via a local-area network or dial-up lines. That spectrum of applications — the main object of our examination — is broken into several bands representing various classes of products by function. While many products fit into each band, only a few are listed as examples.

Groupware developers recognize that it usually takes frequent staff meetings to accomplish any major task in business. Ideally, groupware mirrors the group's daily work flow, enabling group members to meet on-line. This improves communication and is more convenient than meeting face-to-face.

Groupware in its most basic deployment involves input from multiple users working on a common task. Users' microcomputers run software that enables them to communicate information necessary to accomplish this task, share comments, questions and answers among themselves as well as access and use other applications.

Groupware should not be seen as a tool around which to structure a process. Instead, the way the organization works should structure how it uses groupware.

This is a tall order. No software package can realistically be expected to fit the work flow of every organization. This work flow is typically defined using the following rules:

- Identification of goals.
- Development of tasks necessary to reach those goals.
- Assignment of task responsibilities (group formation).
- Development of work flow (for example, intermediate goals, thresholds and alarms).
- Initiation of work flow.
- Monitoring/management of work flow.
- Task completion.

Groupware comes into play in only a part of the work flow process. It should enable an organization to efficiently coordinate tasks among group members, thus developing a work process. It should then be usable by the group to actually accomplish the desired tasks. Finally, groupware

(continued on page 34)

With groupware, groups may never have to meet face-to-face again.

Briere is president of TeleChoice, Inc., a Montclair, N.J., telecommunications consultancy specializing in long-distance service analysis and network design. He can be reached at (201) 746-0200.

(continued from page 33)
should allow for some monitoring/management functions, so that members of the group can see who did what and when.

The biggest interest in groupware among users today is in the microcomputer arena. This is due to the widespread availability of powerful microcomputers, which can be connected easily.

There is groupware for almost any type of computer. The first groupware programs were designed for use on minicomputers, enabling them to act as servers to attached terminals and microcomputers. This was a holdover from the old mainframe environment, in which all applications resided on a central computer and were accessed only via terminals.

Today, the majority of groupware programs are built for the microcomputer environment and, as such, are currently split between two camps: one that includes IBM Personal Computers and Personal System/2s running DOS or OS/2, and another comprising the Apple Computer, Inc. Macintosh. That split is disappearing, however. Most vendors with products for the Macintosh are working on DOS and OS/2 versions of their products, and

> Groupware still follows the old mainframe model but is usually more flexible.
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DOS- and OS/2-based vendors are likewise working on Macintosh versions.

Within these two camps, there are LAN-based and remote products, which operate over dial-up telephone lines or other links between physically remote work sites. Almost all groupware products are LAN-based or at least LAN-compatible.

The most popular LAN operating system among DOS developers has been Novell, Inc.'s NetWare. For the Macintosh, the choice is limited to the communications facilities built into the Macintosh operating system, which enable the Macintosh to support networking standards, such as Ethernet and token ring.

In fact, at least one groupware developer, Arlington, Va.-based Group Technologies, Inc., uses the communications tools built into the Macintosh, rather than building and running its own.

Groupware still follows the old mainframe model but is usually more flexible. Most products use a client/server structure in which the host application resides on a server, as do the master copies of documents or other files.

Client software on each microcomputer enables users to access the groupware application on the server and bring up the file on which they want to work. With some programs, multiple users can pull up copies of a master document and work on them. Any changes may be saved into the master document, or the copy can be erased or stored separately on each user's computer.

Depending upon the groupware package used, each user's changes can be identified and time-stamped for future reference.

The spectrum

Groupware is best thought of as a spectrum of applications, ranging from basic, store-and-forward text manipulation to real-time, simultaneous videoconferencing at the desktop. For convention's sake, the spectrum can be visualized as running from left to right.

At the far left are basic applications such as E-mail. In the strictest sense, E-mail can be thought of as groupware because it enables users to initiate messages, append documents to those messages and send them on to the next person for review and comment.

The problem with E-mail is that it usually leaves no easily discernible audit trail. Often, the next user can't tell who has done what to the document or when, although such functions are sometimes included in advanced E-mail packages.

The next band of the spectrum includes communications programs that allow users to remotely access files on each other's computers. In some cases, users can actually see the file access taking place. But they have no input to the transfer process, and the process itself is limited to file transfer.

With these products, there is no real interaction between users toward accomplishing an objective, other than getting a file transferred. Most currently available modem communications programs support some measure of this functionality.

At the far right of this band are the first programs that start to fulfill the real-time, multiuser promise of groupware. These programs allow more access and control than the basic communications programs.

An example is the Carbon Copy line of products from Microcom, Inc., with which a user can access another computer (with that computer's permission, of course). The user can then access and control an application — not just a file — on that host. The guest computer dialing in and controlling the host application sees exactly what is on the host screen.

Such programs are particularly useful in two areas. The first is a help-desk application, in which a user connects with the help desk via LAN or serial (dial-up) connections. The help-desk operator takes control of the user's application, sharing the same view as the user. The help-desk operator can then guide the user through the process for solving a problem and watch while the user executes the necessary commands.

Intermedia Communications of Florida, Inc., a Tampa, Fla.-based competitive local carrier serving southern Florida, uses such a remote access and control program to provide its customers with assistance in telecommunications network management. Intermedia declined to divulge what package it uses but says the program allows help-desk personnel to aid users of its network management package in working out problems.

The second useful area for remote access and control applications involves a remote user, such as a sales representative on the road with a laptop, who calls in to the host computer and accesses files and applications that would take up too much disk space and operate more slowly on the laptop computer.

Intertech Engineering Associates, Inc., a Dedham, Mass., contract software development and systems integration house, is a user of Carbon Copy Plus 6.0, an enhanced version of Carbon Copy. Intertech uses the package internally to enable staff using portables at home or on the road to send messages and exchange files with users at headquarters.

The firm also bundles Carbon Copy Plus 6.0 with its Sales Con-

> The problem with E-mail is that it usually leaves no easily discernible audit trail.
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trol application, enabling sales personnel on the road or at home to upload activity information and have the hosts dial out once a week to download more recent sales lead information.

"It's a totally automated system," says David Vogel, Intertech's president. He sees the combination of the two products as an enhanced form of telecommuting.

Lastly, Intertech bundles Carbon Copy Plus 6.0 with software similar to Sales Control and sells it to firms that operate branch offices, such as banks. This would allow a bank with seven offices, for example, to update and download files.

Vogel acknowledges that Carbon Copy Plus 6.0 probably has not kept up with the rapidly changing demands for group connectivity. "The scripting languages have not changed all that much since the product was originally sent out," he says. Carbon Copy Plus 6.0 includes a scripting language that automates certain tasks, such as dialing a remote system.

Vogel says Carbon Copy Plus 6.0 falls short of being true groupware because it doesn't allow users to simultaneously work on a file. Instead, it helps firms ensure that data bases are constantly updated and contain the same information.

Packages in this band of the spectrum list for about $150 to $200 per user. Carbon Copy Plus 6.0 lists for $199; the software also comes bundled with some Microcom modems. Users can update earlier versions of Carbon Copy to Carbon Copy Plus 6.0 for $49.

The next band of the spectrum is a wide one and includes the sequential, or update, type of advanced word processing/group document management applica-

(continued on page 36)

At the front line with groupware

Often, the only way to understand how well something works is to use it yourself. That's just what we did when we used groupware to put together one of the graphics to illustrate this article.

In publishing, when the author developing a graphic idea isn't working on the premises of the magazine or newspaper, a sketch is faxed to the publication for review and comment. The publication makes changes and returns the graphic to the author for similar review.

This process continues until each party is satisfied with the changes made by the other. It can be a long and tiresome process, especially if there are misunderstandings between the two parties.

Such misunderstandings usually occur because no two people describe the same thing the same way. So even when each party is looking at identical hard copies of the graphic, there is too much room for misinterpretation.

To get first-hand experience with groupware and to determine whether it really is possible to save time and money using such products, we used document conferencing software — a product called Aspects, made by Group Technologies, Inc., of Arlington, Va. — to prepare the graphic on page 36.

Network World and TeleChoice, Inc. were joined by Group Technologies in a conference call. Group Technologies was included to assist us in our first-time use of their product.

We at TeleChoice in Montclair, N.J., initiated the conference call with all three parties. We dialed into the local-area network at Group Technologies' headquarters in Arlington and also into the Macintosh-based graphics system at *Network World* in Framingham, Mass., using 2,400-bit/sec modems over standard telephone lines.

This conference was supplemented with a three-way audio conference, also over standard dial-up lines. (If we were using an Integrated Services Digital Network Basic Rate Interface circuit, we could have combined voice and data on the same facility.)

Using Aspects, TeleChoice and *Network World* designers were able to jointly develop the graphic. Each party was able to see in real time what the other created as it was created. Changes made by each party appeared nearly instantaneously on everyone's screen.

Moreover, the input of each interested party was instantly available and usable. *Network World's* designers and editors were able to direct the size and style of the graphic and ensure that it would be clearly presented. TeleChoice was able to add or delete information as directed and to redesign the graphic "on the fly." And Group Technologies was able to verify the accuracy of the technological information.

Overall, the entire process took about an hour — quite a savings in time over the standard two to five days and multiple facsimiles and telephone calls such a process previously required. And the end project was satisfactory to all concerned, and — most important — correct the first time through.

While we cannot extrapolate our experience with one product to all products across the groupware spectrum, we did convince ourselves — and our editors — that groupware can work well when applied correctly.

— Daniel Briere and Bruce Guptill

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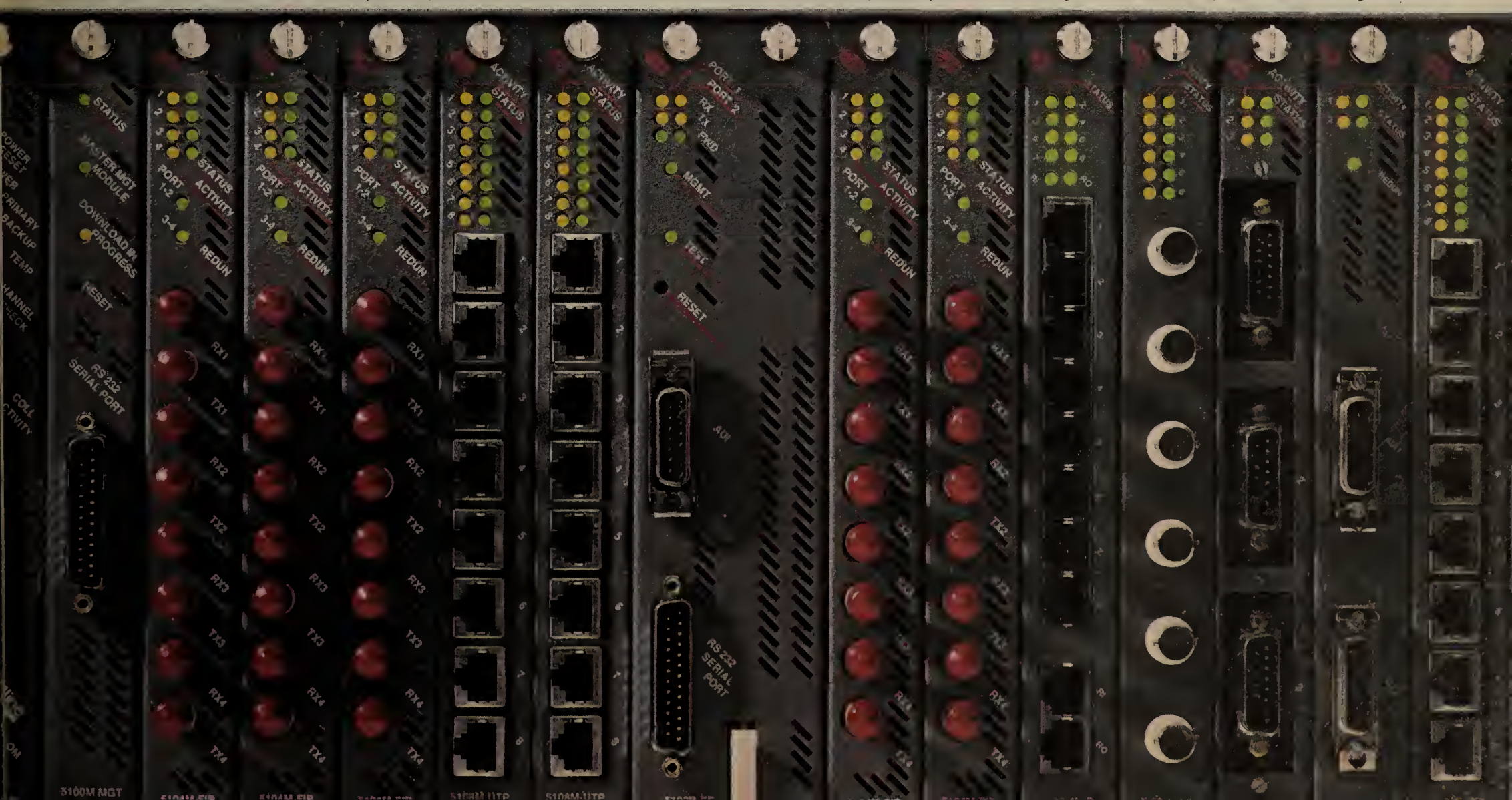


(continued from page 34)
tion. These products are mostly word processor-based packages that track the progress of document creation and updating. They are currently the most popular groupware programs, chiefly because they are among the most heavily marketed.

Because they are usually document-oriented, these applications don't often have the flexibility to actually support other applications being run concurrently, as do the remote access and control programs.

However, such programs are closer to our definition of real groupware in that they provide an audit trail of user input and can be manipulated in near-real time by more than one user.

For example, once a task is set, and the group to accomplish the task is organized and defined, the initial document is created by one user. When finished with his initial input, this user sends that document back to the server, where the next user or users can access it, make changes and store the document again.

Some packages alert the next user that the document is ready for input by flashing a signal on the microcomputer screen or sending an audio signal to the microcomputer. This goes on in some predetermined manner, which is usually programmed by the work group leader, until the document is finalized.

Throughout the process, user comments and changes are noted and stored by the program. These changes may be stored in the master document file or individually by users for later inclusion into the master file. The ability to identify comments and the process by which changes are accomplished differs from program to program.

All together now

The programs that most closely approach this real-time, simultaneous group interaction are those that allow multiple users to access a single document at the same time. In such programs, each user typically calls up a copy of the master document, which is stored on the network server. The individual users make their edits and then store their copies of the document.

As these copies are stored, the program updates the master copy in the server, so that the master reflects the latest possible changes and comments. An excellent example of this type of program is ForComment, from Access Technology, Inc. of Natick, Mass.

Some programs, such as Instant Update or Meeting Maker, both from ON Technology, Inc. of Cambridge, Mass., allow the master copy to be updated while the users are working on their copies. A user wishing to update the master can do so by a menu command. When the command is invoked, the master document and each copy currently being used are all updated simultaneously, while also identifying the updating user.

Depending on the individual program, users have the option of having the copy of the master file on their screen updated as changes are made. Or, if they don't want their own work interrupted, they can wait until a more propitious time, such as when storing or saving their own copy of the file.

Dartmouth College in Hanover, N.H., uses Instant Update to maintain current user documentation and help-desk texts. The College's Consulting Group is responsible for supporting the installed base of computers at Dartmouth, including IBM Personal Computers, Macintoshes and mainframe computers.

"We use Instant Update as a communications bridge between our consultants," says Andy Williams, a user services consultant at Dartmouth. "We have support documents for a range of computer types, which we are constantly updating based on new problems and questions from users. By updating these documents, the consultants can access the most recent documentation to help answer the next caller's questions."

Williams likes the Instant Update approach over E-mail. "This is a permanent record, unlike E-mail, which is more for announcements that go away after the user has read them," he says. "It's also more reliable. Our E-mail system goes up and down, but Instant Update runs on our Appleshare server, which is very reliable."

Before Instant Update, Williams' group did not maintain such centralized documentation. "There was a lot of E-mail going back and forth and misinformation, too," he says.

Programs in this part of the band average about $100 to $200 per user. ForComment, for example, lists for $895 for a ten-user version that runs under NetWare. Meeting Maker lists for $495 for a five-user license and $895 for a 10-user package. Instant Update lists for $495 for two users and $995 for five users.

Group Notes

Farther to the right in this band of our spectrum are the more multifaceted groupware programs such as Lotus Development Corp.'s Notes.

> "We use Instant Update as a communications bridge between our consultants."
>
> ▲▲▲

Notes, which arrived on the scene in 1989 with much fanfare, is more than a document manipulation program. Notes stores all information generated by users in data bases located on multiple network servers. This data base information can include reference materials for different projects, such as a newswire feed, or almost any sort of information that can be stored in a computer. The data bases are configured by the users.

Notes functions include a distributed document management system, E-mail, user directories and address books, and a word processor with basic capabilities. It also includes a context-sensitive hypertext help function.

Notes maintains copies of necessary data bases on various servers on the network, replicating each automatically according to preprogrammed, user-configurable requirements. Information can be shared using Notes' View function, a document open/edit function or through its built-in E-mail.

"Notes is an additive model," says David Marshak, an analyst with the Patricia Seybold Office Computing Group in Boston, Mass. "In a broad definition, it is a tracking/publishing application." The firm uses Notes for internal and external communications, as well as for client and project tracking.

"We have developed it as a tool for internal discussion and debriefing — to share information among our staff here," Marshak says.

He adds there is a significant learning curve for beginning users of Notes. "It's not necessarily intuitive, although the ease of data base development is amazing."

Lotus admits training is an important aspect of the product but doesn't feel the learning curve is significant.

"More exciting to us is the fact that we see Notes as an external, product delivery vehicle," Marshak says. "It's an electronic publishing vehicle to be used with other Notes users."

He also sees Notes as more of an information-sharing tool than a work flow organizer and facilitator.

Notes is priced at $62,500 for a 200-unit license and is available through value-added resellers or directly from Lotus. Lotus adds that smaller quantities of the program are available through value-added resellers. IBM announced in June that it will resell Notes and work with Lotus to build Notes features into the next version of OS/2.

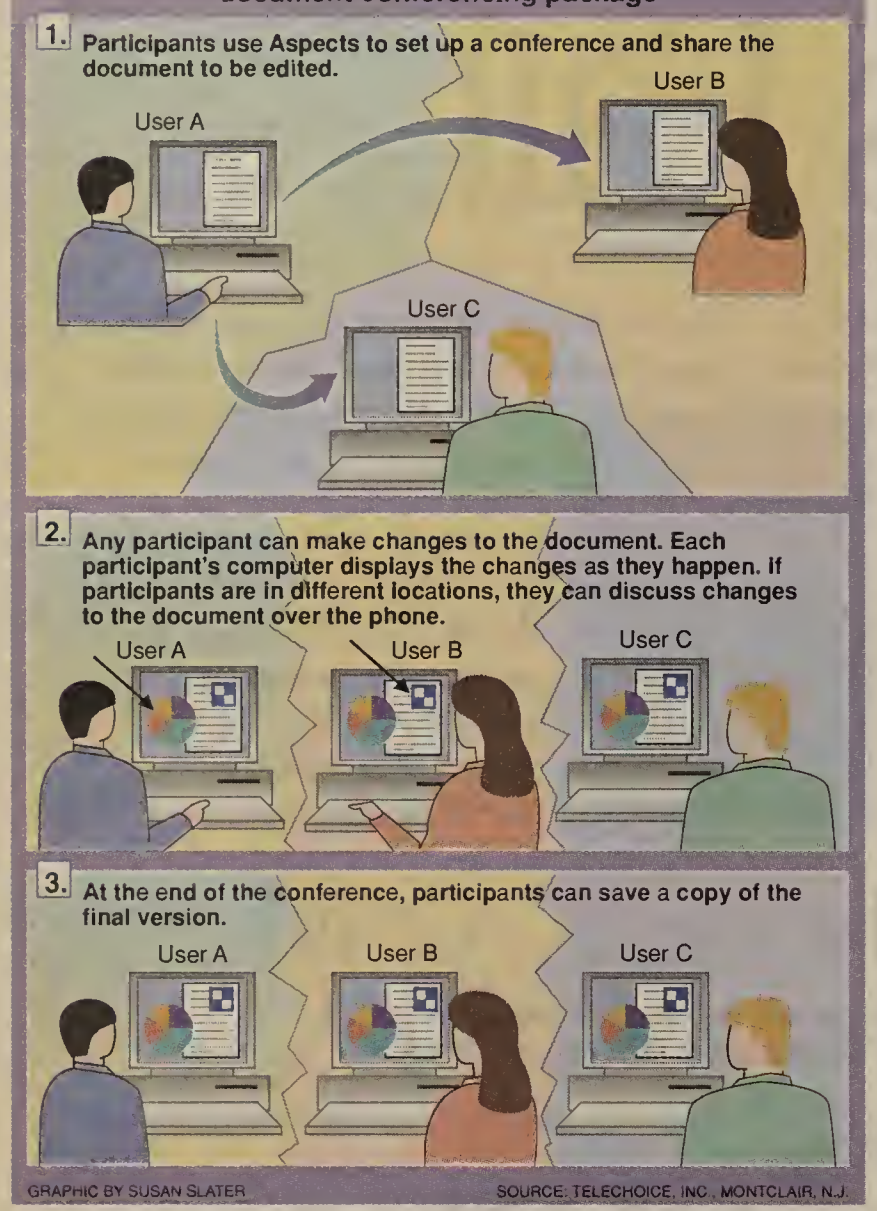
In the same band as Notes is the type of product that provides a groupware environment. Such

(continued on page 46)

A groupware application in action

Figure 1

Group Technologies, Inc.'s Aspects document conferencing package



GRAPHIC BY SUSAN SLATER SOURCE: TELECHOICE, INC., MONTCLAIR, N.J.

Groupware packages in this article

Figure 2

Company	Product	Description	Price
Access Technology, Inc. Natick, Mass. (508) 655-9191	ForComment	Server-based, sequential-update document conferencing application	$895 for 10-user Novell, Inc. NetWare version
Coordination Technology, Inc. Trumbull, Conn. (203) 268-4045	Together	Desktop task integrator and operating shell application	$4,995 for server component plus $1,495 for 5-user license
Group Technologies, Inc. Arlington, Va. (703) 528-1555	Aspects	Peer-based, real-time, simultaneous document conferencing application	$299 for 1 copy; $895 for package of 5; $1,295 for package of 10
Lotus Development Corp. Cambridge, Mass. (617) 577-8500	Notes	Server-based document and task management application	$62,500 for 200-unit license (lesser quantities available through value-added resellers)
Microcom, Inc. Norwood, Mass. (617) 551-1000	Carbon Copy Plus 6.0	Peer-based remote access and control application	$199; updates to previous releases available for $49
ON Technology, Inc. Cambridge, Mass. (617) 876-0900	1. Instant Update 2. Meeting Maker	1. Server-based, sequential-update document conferencing application with real-time update capability 2. Server-based, sequential-update scheduling application	1. $495 for 2-user license; $995 for 5-user license 2. $495 for 5-user license; $895 for 10-user license

This table reflects only those programs discussed in the accompanying article. There are many other vendors offering different types of groupware programs.

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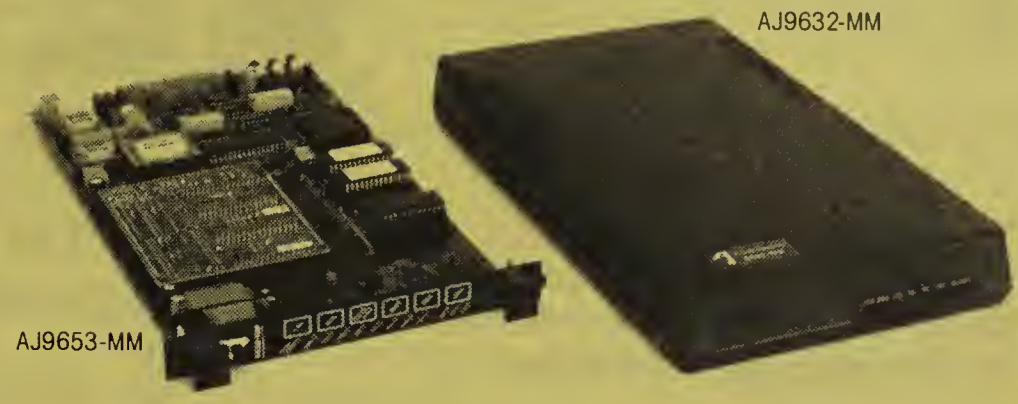

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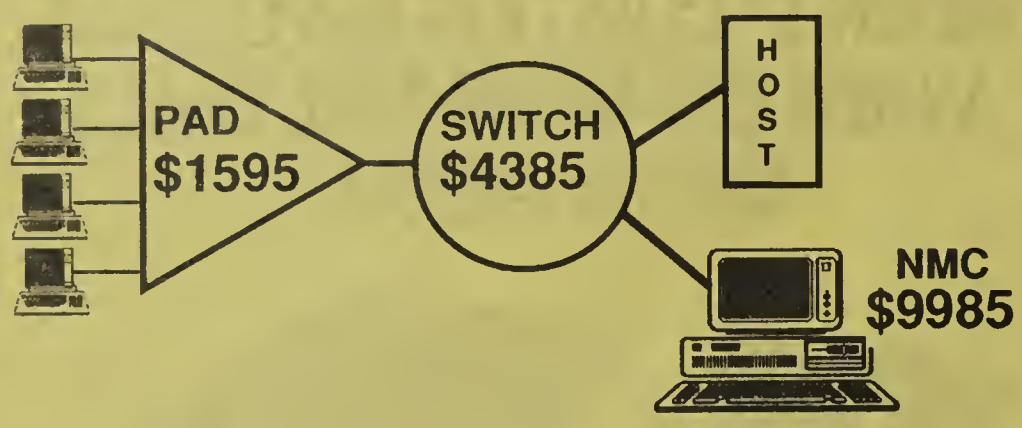

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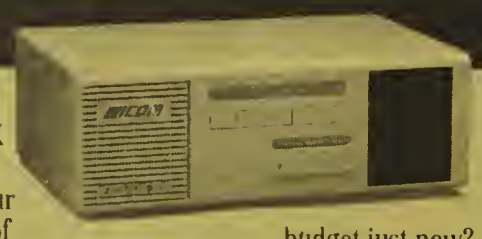

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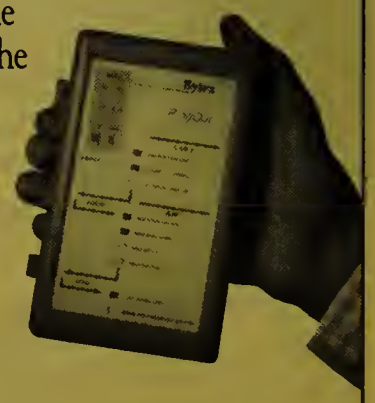

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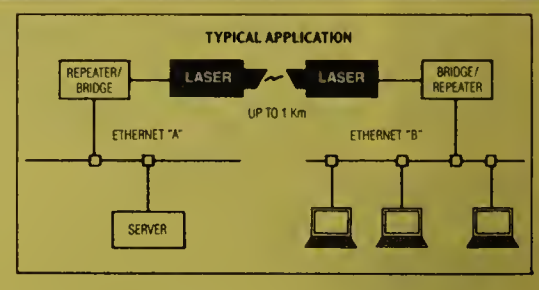

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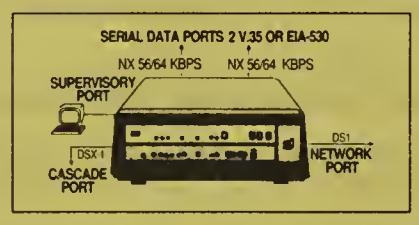

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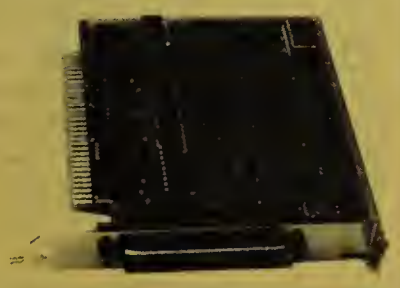

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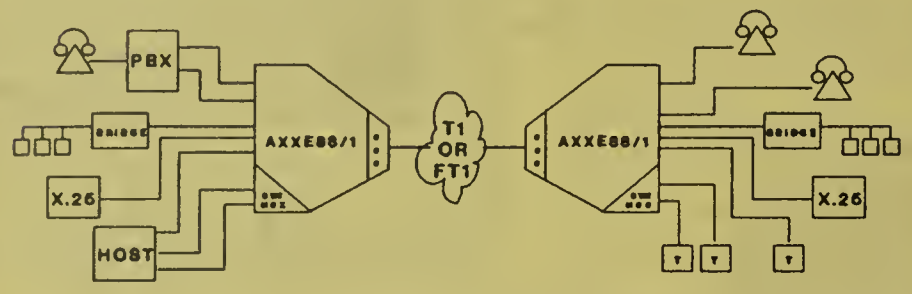

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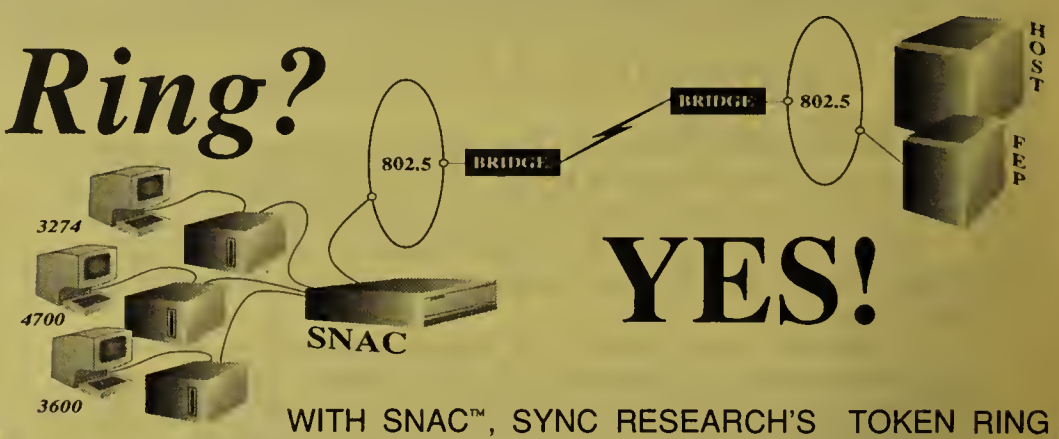

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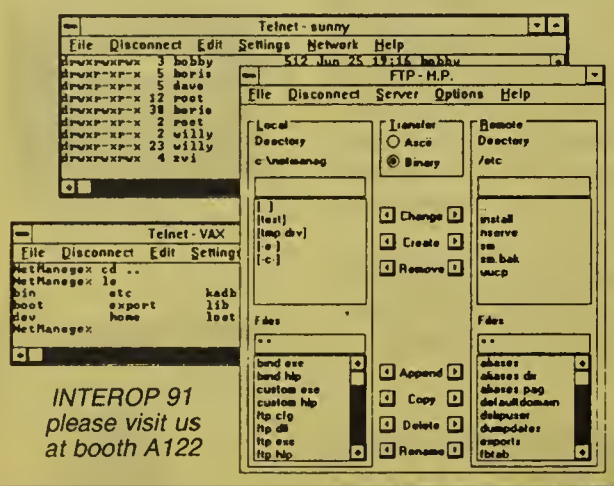

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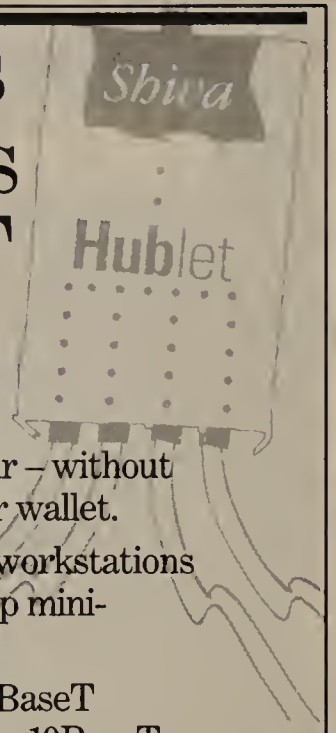

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The work group of the future

continued from page 36

products may be called application integrators or groupware shells. These software packages provide a desktop environment in which multiple users can access multiple applications through a windowed desktop screen.

A leading package in this category is Together, a product from Coordination Technology, Inc. in Trumbull, Conn. Together builds a shell in which the work group is defined by creating activity desks, which are sent to each work group member by a group leader.

Each activity desk enables a user to work with other members on an activity. Each user can have multiple activity desks to work on at any time. Output is turned into objects that users exchange across activity desks, triggering a color-cuing system that tracks the tasks.

Other applications can be encapsulated within Together, thus integrating stand-alone or groupware software applications into the Together desktop environment. Together supports the integration of several word processing, spreadsheet and data base programs. It also can integrate Lotus Notes into the desktop environment. Users can collaboratively work on projects using Together and disseminate the projects to others using Notes.

The list price for Together is $4,995 for the server component, plus $1,495 for a five-user license. The product is sold through the company's direct sales force, although there are plans to sell it through value-added resellers, system integrators and LAN resellers.

Desktop conferencing

In the next spectral band are those few programs now available that allow real-time, simultaneous interaction by multiple users. One such program is Aspects, a peer-based Macintosh package from Group Technologies.

With Aspects, between two and 16 users can simultaneously access a document that is stored on one machine. The users can concurrently edit, comment on or otherwise change the document, with each seeing the others' changes as they are made. Moreover, users can work on different parts of an original document at the same time. Documents can include text, graphics and image files.

Group Technologies suggests that Aspects users also converse via the telephone while computer conferencing, so they get the visual and audio input necessary to a successful conference (see "At the front line with groupware," page 34 and Figure 1, page 36).

The National Aeronautics and Space Administration is currently evaluating Aspects for inclusion into a conferencing system it is developing.

Marion Hansen, project director for NASA, says the agency plans to use the software to support group conferences of two to five participants from NASA, other agencies, schools and universities, and industry, using its own networks, dial-up connections and the Internet. The conferences will include text, graphics and image documents, as well as video and audio.

Hansen sees great potential in groupware. "As soon as you have some sort of communications tool like this in use — even E-mail — you can get more work done and have fewer, smaller meetings," he says.

The only drawback Hansen sees is the lack of support for some business applications, such as spreadsheets. He believes Aspects, along with other programs, will need to support more than just the current word processing text and graphics applications.

"Spreadsheet support is essential," Hansen says, adding that today's users extensively use the text and graphics capabilities built into spreadsheet programs.

Aspects is the sort of full-duplex application that users tend to think of as real groupware; something that fulfills the real-time, multiuser promise of groupware by allowing users to communicate and interact as they would in a meeting or other office situation.

Perhaps one of the most appealing parts of Aspects is its low price. Single copies cost $299; a package of five is priced at $895; and a 10-pack costs $1,295.

Still to come

At the far right of the spectrum are products that aren't yet commercially available but are in various stages of development. These products are desktop conferencing packages — software that enables users to mix text, images, graphics, video and sound in a single live conferencing session, using a single terminal on each user's desktop.

Many projects are in development and most are cloaked in secrecy. Almost every major software developer has some sort of desktop conferencing project under way, most of which are limited to real-time group text and image manipulation.

Perhaps the closest thing to a commercially available product in this band is the Videoplace technology invented by researcher Myron Krueger. Videoplace lets multiple users simultaneously send and receive images, with the images combined on a single screen at each user's desktop.

Some large firms in the Far East and the U.S. are exploring commercial ventures based on Videoplace and similar technologies. These ventures include rolling out a product or service that would be available to customers as well as choosing a product for internal use.

The sum of the group

"Groupware is — or should be — computer-based systems that assist groups of people working on a common task and provide an interface to a shared environment," says Bob Johnson, ForComment product manager at Access Technology.

While most groupware developers hold a similar view, some dissension does exist. That is why we now have such a broad spectrum of groupware applications, from E-mail to remote access to sequential updates to desktop conferencing.

It's also why there are so many different products. But that is not a bad thing; competition in any market tends to bring prices down, while providing users with such a broad range of choices that they are more likely to find the product that fits their needs.

There are disagreements in the industry as to what is proper groupware. Some vendors purposely do not allow simultaneous or instant updating of files in the above manner.

Johnson sees a problem with the effects of such updating on the work flow because sudden interruptions from another worker could disrupt a user's thought process. The problem, Johnson says, stems from a lack of flexibility on the user's part as to when and how the work is being done.

"The key success factor for groupware is the flexibility to be molded to the way the corporation works," he says.

T. Reid Lewis, president of Group Technologies, thinks simultaneous interaction and task accomplishment is what groupware is meant to be. His firm specifically designed real-time editing into Aspects because he says that is the way real people interact in real situations.

"If [Alexander Graham] Bell had thought the way most groupware application developers do, he would have invented voice mail, not the telephone," Lewis says.

For most users and vendors, it's a matter of degrees. "There is no question that the concept of groupware is growing, even among the most computer illiterate," Intertech's Vogel says. "Two years ago, we were preaching about connectivity to our customers and they wouldn't hear of it. Now, they are calling us asking for wide-area connections."

Until the ultimate in groupware products is on the market, however, users will continue to get by.

For Williams' Dartmouth consultants, that's not so hard. As he says, "We're lucky. We're all in the same office so we can still just shout at one another."

Telecom execs stretch nets

continued from page 2

year ago and since then the state has made several moves to cut telecommunications costs. Cost-cutting efforts include making joint procurements of services, such as AT&T's Software-Defined Network offering, with other states via NASTD's joint procurement committee, he said.

Bob Dixon, director of communications architecture for Connecticut's Office of Information and Technology and NASTD's new president, said budget cuts are a big concern of state telecommunications directors.

"The top concern for us, especially in the East, is that the economic situation in running state government is perhaps a little worse than it is in the economy in many other areas," Dixon said.

"State budgets are cut not always in line with what is happening in the local economy," he continued. "Some states actually have decent recovering economic situations in the general economy, but due to revenue situations or just the urge to downsize government, there are pressures to deliver more for less."

State net managers are looking for ways to adjust investment schedules on long-term network projects to give them the flexibility to invest in newer applications that roll out, Dixon said.

Larry Stolz, the NASTD's outgoing president and administrator for the telecommunications division of Wyoming's Department of Administration, said the network department too often is a target for budget cutbacks.

"It's easy to see where money gets spent for something in the area of telecommunications, and that can be one of the first areas where there's pressure to cut," Stolz said. "The director has to be effective in making sure that doesn't happen and showing that there can be additional services performed for the same dollars."

Glenn Mayne, director of Florida's Division of Communications, did just that in getting the go-ahead on a project to restructure some of the state's IBM Systems Network Architecture nets. Although Mayne declined to furnish details on how much the project will cost and save, he said he was able to convince Florida legislators that making an initial investment in the SNA network redesign would save the state money.

Florida has begun installing remote IBM 3745 front-end processor nodes running Network Control Program software at a few central sites to consolidate traffic running over previously separate SNA nets serving the criminal justice department and more than 10 other state agencies. The state already owns some of the 3745s and is simply redeploying them.

A pilot test was completed in Tampa, Fla., and nodes will be installed this month in Pensacola and Orlando, Fla., next month, Mayne said.

Mayne said finding ways to stretch the existing network infrastructure is critical in that network usage is rising as state employees use the telephone to compensate for travel cutbacks. Network traffic grew 12% in Florida over the past year.

Letters

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Expecting MIB designers to coordinate variable names so that local names are never duplicated, even among different vendor-specific MIBs, is unrealistic.

A review of this kind would be of more immediate use to readers if the author gave more credit to the fact that vendor-specific MIBs can indeed provide valuable supplements to the standard MIBs.

In combination with generic network management stations, these vendor MIBs can allow products to be managed using SNMP in the interim.

Kathryn de Graaf
Senior research and development engineer
David Systems, Inc.
Sunnyvale, Calif.

Author's response: It appears Ms. de Graaf did not read the complete article. The controversy over "ports" vs. "interfaces" as pertains to SNMP management of hubs was thoroughly discussed on page 47 in the accompanying story "Coming soon: SNMP standard for hub management."

Ms. de Graaf is incorrect in stating as fact her opinion that "Ethernet repeater ports are not *interfaces . . ." Clearly, she and David Systems feel that hub vendors each need a unique set of standard MIB objects for managing their devices. To every user with whom I've talked, a hub port meets every characteristic of what most people would consider an interface.*

But the real issue here isn't whether hub ports are, in fact, interfaces. It's more fundamental than that. I am dismayed to see that the success of SNMP has attracted legions of vendors that now want to remake SNMP in their own image.

If enough special object extensions are appended to the Internet-standard MIB, we may wake up one day and find we need a Cray Research, Inc. computer to manage a "simple" SNMP network.

Edwin Mier
President
Mier Communications, Inc.
Princeton Junction, N.J.

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Columbia U. researches net

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wide 1G bit/sec optical net, which last week gained the backing of the U.S. Senate (see "Despite Senate's endorsement, NREN still has long road ahead," page 4).

The researchers have devised a method that exploits the full bandwidth of fiber by dividing a fiber's capacity into thousands of channels operating on different wavelengths of infrared light, instead of using the fiber to support a single channel, according to Anthony Acampora, director of the Center for Telecommunications Research (CTR) at Columbia and professor of electrical engineering here.

Currently, fiber speed is limited by the rate at which lasers can convert electrical signals into pulses of light, about 1G bit/sec. But each channel in the prototype network can support speeds of about 1G bit/sec. And since there are about 10,000 possible wavelengths of infrared light, the total potential throughput of the optical net is theoretically 10,000G bit/sec, or 10 terabit/sec, hence the name TeraNet.

"If you think of the capacity of optical networks as a football field, today we're playing the game inside the 1-in. line," said Acampora, who began developing the concepts behind TeraNet years ago when he was director of network systems research at AT&T Bell Laboratories.

Researchers plan to implement a prototype of TeraNet at Columbia within two years that will enable dozens of scientists to support applications requiring extremely high bandwidths. Researchers are currently operating a two-node optical network in the CTR laboratory.

Topology freedom

The physical topology of TeraNet could take a star, tree, bus or any combination of the three. The net would operate as a packet network using Asynchronous Transfer Mode (ATM) switching and would not be limited by the number of users or distance.

In TeraNet, each network node can support two or more infrared light frequencies, or wavelengths. Since different wavelengths of light do not interfere with one another, all net nodes can transmit data simultaneously across a fiber at speeds of 1G bit/sec. The drawback of this is that nodes can only receive data if they are tuned to the wavelength of the sending station.

To overcome this limitation, Acampora and CTR researchers have developed a multihop scheme in which messages are relayed through various network nodes — each of which can accept data in one wavelength and output it in another — until the data reaches a node that can output the message in a wavelength supported by the target device.

Each node also contains a small ATM switch that reads packet addresses of data captured by the node's optical receivers. The ATM switch determines whether packets should be routed to a local port or reconstituted as an optical signal and sent to another node.

The number of hops needed to send messages from one node to another depends on the number of nodes in the network and the number of distinct wavelengths each node supports. Nodes that support heavy traffic can be configured with a direct or single-hop connection, Acampora said.

Although each node needs to support at least two frequencies, TeraNet nodes may either transmit or receive up to 32 distinct wavelengths, minimizing the number of hops needed between nodes, Acampora said. But the more frequencies each node supports, the fewer possible nodes there are in the net since there are only 10,000 infrared frequencies available.

There are two ways to circumvent this size limitation, Acampora said. The first is to implement devices called optical combiners/dividers. These devices route specific wavelengths of light from one optical fiber to another, enabling designers to reuse wavelengths on subnetworks. The other method is to partition a single wavelength of light into multiple recognizable frequencies using amplitude modulation.

Amplitude modulation avoids another significant problem: Today's laser's are not capable of reliably producing hundreds, if not thousands, of separate wavelengths. Most commercially available lasers today emit light in only two wavelengths and cannot be easily tuned. Acampora is confident, however, that lasers with this capability are not far off.

Perhaps a more daunting problem is the fact that optical networks, such as TeraNet, will require development of new, efficient communications protocols.

New protocols

The processing required with today's software-based protocols will severely bog down gigabit-speed networks. Streamlining protocols will require elimination of functions designed for lower speed nets and implementation of other functions in hardware.

"We need to increase the efficiency of existing protocols by three orders of magnitude," Acampora said. Other hurdles include the need for sophisticated routing tables and a net management system to support the optical network.

Despite these obstacles, Acampora and other CTR researchers are confident in TeraNet. "Our research is attempting to define the knowledge and, maybe, the approach for a nationwide network infrastructure for the 21st century," he said.

HP, IBM winners in OSF mgmt. plan

continued from page 1

sen by the OSF. But he reiterated DEC's support for the DME.

"We have stated we will support what they choose and will implement it eventually," Viola said. "Win, lose or draw, that will remain the same."

Although it was unclear exactly what pieces of technology were chosen from each vendor, HP and IBM made a joint submission based on HP's OpenView as the core integration platform.

The major piece submitted by Groupe Bull was a management application program interface, while the Banyan portion is event management software that the local-area network vendor acquired the rights to last week from Wang Laboratories, Inc.

Bill Johnson, vice-president of product marketing at Banyan, confirmed that the software, Network Logger, would be part of the DME. Network Logger supports the management and logging of what Johnson called extraordinary network and system events. It can also be used to create management reports and be queried by other error recovery or reporting mechanisms.

Perhaps the biggest surprise in the DME's selection is Tivoli Systems, a software company in Austin, Texas, that specializes in object-oriented software.

Stan Tims, vice-president of marketing for the company, said Tivoli makes object-oriented tools to aid programmers in developing applications and to help vendors develop object-oriented descriptions of their products. The company also develops software used to manage groups of objects. For example, users can set predefined policies that apply to a group of similar objects.

That approach to management fits with how the DME will be structured.

Jonathan Gossels, business area manager for the OSF in Cambridge, Mass., said the DME will rely heavily on object-oriented technology and will include generic management services, such as a service that lets users group net resources by geography, function or other criteria.

Policies could then be implemented to manage those resources as a group.

Jim Herman, a principal at Northeast Consulting Resources, Inc. in Boston, said the DME will use objects in two ways. The first is by defining resources according to the Open Systems Interconnection Guidelines for the Definition of Managed Objects, which is basically a way to define the attributes of a device or event as an object.

"The other half is where the DME takes a step far beyond what has been done in any standards arena," Herman said.

Programmers will use object-oriented technology to develop applications more easily, he said. Those applications can support the concept of methods, which are code associated with an object that provide details on how to perform various tasks on that object. For example, a router could have methods associated with it that detail how to change its algorithms.

The methods can be triggered by an operator via the DME user interface or another object, paving the way for automated management, Herman said.

"It promises much better integration of software from lots of different vendors, and it's much easier for users dealing with management of multivendor systems," he said.

Among the protocols supported in the DME will be the OSI Common Management Information Protocol and the Simple Network Management Protocol, Gossels said. Also supported as a management protocol will be the OSF's remote procedure call, which will initially be used mainly for systems management applications.

Because DME is highly portable, DME-compatible applications could run on a variety of hardware and operating systems.

"[DME will] make it much more lucrative to go out and write management applications," Gossels said, "which means a few years down the road, end users are going to have a much richer selection of applications to choose from."

NREN still has long road ahead

continued from page 4

Administration, National Institute of Standards and Technology and Defense Advanced Research Projects Agency. The Gore bill names the NSF to initially manage NREN, although the eventual shift to the private sector is envisioned.

S. 272 also instructs the director of the White House's Office of Science and Technology Policy, as the overseer of NREN, to begin to promote the development of information services for NREN by making available on-line federal agency data bases of unclassified information, a plan opposed by the White House.

Gore's plan for the network, which he has nurtured for 10 years, suffered a preemptive strike by the White House last February. At that time, the Bush administration unveiled its own version of NREN for the first time, outlining in the 1992 budget request its own plans for a new High-Performance Computing and Communications Program, with $638 million in funding for the first year.

The White House NREN plan would provide research and development funding as a catalyst for private sector actions, Allan Bromley, director of the Office and Science Technology Policy, told Congress last spring as he urged lawmakers to let the Bush administration take the lead on NREN.

> The White House NREN plan would provide R&D funding as a catalyst for private sector actions.
>
> ▲▲▲

The House appears to have heeded Bromley in part, and H.R. 656, originally the companion bill to S. 272, has been modified to say that federal agency NREN activities "may include research and development, development of network applications important for research and education, and contracting for services, but shall not include purchasing switches, optical fiber or any other networking hardware for purposes other than research and development."

Last April, when H.R. 272 was passed by the House, the H.R. 656 picked up a protectionist amendment that would effectively shut out foreign participation in the computing program. The White House Office of Budget and Management has indicated that Bush will veto the House bill because of the protectionist clauses.

Last week, key Gore aides were upbeat that a common bill would emerge in the conference process that could win backing by the House, Senate and the president.

Gandalf airs high-capacity mux

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multiplexing (TDM).

The company initially will offer three models. The high-end Infotron 2000 is positioned as a backbone node accepting traffic from the 2300 and 2120 units. The mid-range 2300 and low-end 2120 both serve as feeder nodes to multiplex traffic from computers, telephone systems and other devices onto backbones. These multiplexers, which will ship in December, only support TDM initially.

The Infotron 2000

The Infotron 2000 has 18 card slots, two of which are taken up by redundant node control and node management processors.

The Infotron 2000 employs a new bus architecture, dubbed Quic Bus, that has a maximum capacity of 1.152G bit/sec. But the company estimates the bus speed cuts down to 409.6M bit/sec in nonblocking networks. The Infotron 2000 supports as many as 80 T-1 links or 64 2.048M bit/sec E-1 links.

The mid-range Infotron 2300 also has 18 card slots but only supports as many as 20 T-1 or 16 E-1 circuits. It uses the same bus as the NX4600s, which operates at up to 40M bit/sec.

The Infotron 2300 supports as many as 4,000 asynchronous or synchronous local links at speeds up to 1.98M bit/sec.

The low-end Infotron 2120 supports up to one T-1 or E-1 wide-area network link. It also supports as many as seven asynchronous local links or three synchronous local links at speeds up to 64K bit/sec.

The Quic Bus architecture on the Infotron 2000 line enables networks based on multiplexers to support as many as 3,900 nodes. Networks based on the older NX4600s can have only as many as 96 nodes.

In the second quarter of next year, Gandalf plans to upgrade the high-end Infotron 2000 model to support a proprietary cell relay technology. Gandalf will also upgrade the high-end Infotron 2000s to support T-3 lines.

Cell relay is an emerging broadband technology in which data is encapsulated in cells of fixed sizes, rather than the variable size packets in packet switching. The principal difference between Gandalf's proprietary cell relay technology and emerging cell relay standards that support Asynchronous Transfer Mode (ATM) switching is that Gandalf's proprietary cells have 16 bytes of data, while the ATM standard specifies cells with 53 bytes of data, according to Mark Luczak, the company's senior network specialist.

Luczak said 16-byte cells perform better in T-1 and T-3 networks. Gandalf will migrate to the 53-byte standard if sufficient demand develops, he added.

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US Sprint ups global focus with services

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er countries, he added.

This will mean striking deals with carriers and governments calling for US Sprint to install its own switches on foreign soil or partnering with foreign entities to provide service.

One such project US Sprint is currently considering, dubbed Trafalgar, is building a long-distance network in the U.K. in conjunction with The British Waterways Board. If the deal goes through, US Sprint would install a fiber-optic network throughout the U.K. along the rights-of-way of aqueducts, tunnels and water pipes owned by the British firm.

Keeping up with user needs

Burroughs said the network will be based on Synchronous Optical Network technology and will support primarily high-bandwidth private-line data services between metropolitan areas. However, he said the network could be used for voice and video and, perhaps, even switched voice if British regulators allow it.

"Our assessment is there is a need for large bandwidth in the U.K.," he said. "Network development hasn't kept up with customer needs."

US Sprint is set to wrap up a year-long feasibility study for the U.K. network during the next few months. That evaluation will determine whether there is a sufficient market for a third carrier, how much capital investment will be required and whether the regulatory situation looks favorable.

The British government has already opened its telecommunications market to allow a carrier, Mercury Communications, Ltd., to compete with the former government monopoly, British Telecommunications PLC. Burroughs said it appears the government would be willing to allow a third carrier.

He declined to specify when US Sprint might move into the U.K. and added that the carrier is not at all certain if it will proceed.

Beyond whatever revenue US Sprint could bring in from U.K. customers, building a network there could also prove to be an important key to expansion in Europe.

"The network needs to be self-sustaining; that is a criteria," Burroughs said. "But the U.K. is a major international hub for Europe and North America, and depending how far deregulation goes, obviously we would be well positioned to take advantage of all those markets — Europe and the U.K."

US Sprint is part of a six-member consortium evaluating the idea of installing a fiber-optic network along the rights-of-way owned by railroad companies in 11 European countries. Those 11 rail companies, dubbed the Hermes Community, have an analog data communications network based on proprietary protocols.

The consortium is studying how to upgrade the railroad network to an X.25 system. The other members of the consortium are Nynex Network Systems, a Belgium-based subsidiary of Nynex Corp.; TeleColumbus AG, a technology and information services firm based in Switzerland; Daimler-Benz AG, an industrial and electronics conglomerate based in Germany; Compagnie de Suez, an industrial and financial service firm based in France; and Racal Network Services, Ltd., a division of Racal Electronics PLC based in the U.K.

Product blitz widens horizons

continued from page 1

Analysts said the network announcements addressed many areas of concern but cut no new path in terms of direction.

"It was kind of a shotgun blast of announcements — not much aim but a lot of coverage," said Mark Leary, director of communications research at Technology Investment Strategies, Inc., a consultancy in Framingham, Mass.

PHOTOGRAPHY ©1991 DANILLE SWICK
Bill Warner

Although the net management announcements close gaps and fulfill promises, each comes with a caveat.

IBM said LMU/2 will be available later this month, but only on a request-for-price-quotation basis. IBM said the offering is an interim product whose functions will be folded into another IBM program product over time.

And the NetView GUI upgrade and object-oriented tools are only planned enhancements to appear in NetView Version 2 Release 3.

IBM intends to beta-test the features in the first quarter of next year, with availability scheduled for May 1992. The company did say it expects to ship the new features in less than the two-year window normally applied to IBM statements of direction.

Analysts reacted coolly to the announcements.

"I lost some enthusiasm when I saw the availability dates," said David Passmore, a partner at the Ernst & Young consultancy in Vienna, Va. "The things users really want are not even going to be [formally] announced until the second quarter next year. Who knows when they'll be available."

The enhancements planned for IBM's OS/2 Extended Edition-based Graphic Monitor Facility (GMF) will make good on IBM's promise to merge the capabilities of its DOS-based NetCenter GUI, which can display non-Systems Network Architecture devices, with GMF.

The enhanced version of GMF will display non-SNA network components and give operators the ability to issue commands using a mouse and pull-down menus. Currently, GMF requires users to type text commands.

IBM will provide menu-based commands that let users activate or deactivate a resource, conduct problem determination and access an Information/Management system to retrieve detailed information on a device. Users can also tailor the menus to include their own commands, including those that trigger automation programs.

The new interface will let users zero in from a wide topology view to a failed resource, said Gale Meyer, manager of network management systems in IBM's Networking Systems group. Today, users may have to scroll through a number of progressively more detailed views to find the failed component.

Because it is based on the multitasking OS/2, the GMF offers advantages over the DOS-based NetCenter, such as the ability to access other management tools in a separate window, according to Robert Anderson, marketing communications manager for Networking Systems at IBM.

GMF's interface also complies with the 1989 version of the Systems Application Architecture Common User Access (CUA) interface, he said, and will comply with CUA 91.

CUA 91, announced last week, is a more object-oriented GUI than the previous version, provides smoother user access to data stored anywhere in a network and lets users cut and paste data between different applications.

To supply object-oriented data about multivendor network devices to the enhanced GMF, IBM will offer a host-based Resource Object Data Manager.

"The Resource Object Data Manager is a high-speed, high-performance, in-memory data manager designed to keep up with the status of the network in real time," said Bill Warner, IBM's director of network management in Networking Systems.

Today, the GMF feeds off data provided by a number of NetView data bases. The Resource Object Data Manager will become the storage center for objects that describe both SNA and non-SNA devices. It will also feed device status data to the GMF.

The Resource Object Data Manager, IBM's first implementation of the Control Information Base (CIB) portion of SystemView, is intended to be a high-performance utility, Anderson said. The CIB is a data base of network and system status information that can track rapid changes.

Interim solution

IBM also addressed LAN network management last week with its LMU/2, which Meyer described as an interim step the vendor is taking to address an immediate user need to manage LAN software.

The product runs on a token-ring-attached OS/2 server running IBM's OS/2 LAN Server. It addresses configuration and fault management for DOS and OS/2 client workstations, as well as operations and performance management for OS/2 workstations.

Among LMU/2's features is the ability to collect data on processor utilization, workstation memory and physical disk activity. Users can set thresholds for such items, and LMU/2 will generate an alert when the thresholds are exceeded.

In addition, users can write programs that generate alerts from any program written in C or REXX.

LMU/2 does not feed data to IBM's LAN Network Manager product, which manages LAN hardware problems, although Anderson said the company will likely merge the functions of the two products in the future. LMU/2 can ship alerts to NetView, but NetView can not currently send commands back.

IBM said future versions will likely work with Ethernet LANs and other LAN operating systems.

LMU/2 is scheduled to be available this month. It costs $480 for the first license and $449 for each additional license.

IBM also announced an enhancement to the previously announced implementation of LU 6.2 in NetView Version 2 Release 2, scheduled to ship this month.

The company will offer two levels of LU 6.2 support: Management Services Transport for short messages and High Performance Transport for sending bulk management data. The latter is intended to send system and network management commands to multiple distributed hosts, such as for remote data center management.

Motorola Codex enhances 9800

continued from page 2

fold increase in performance over the current platform, Codex said. The Apollo 3500 is based on a Motorola 68030 microprocessor, while the 9000 uses a 68040 chip rated at more than 20 million instructions per second.

In addition, Motorola Codex announced operational integration on the 9800 NMS for T-1, X.25 and LAN products from 14 third-party vendors, including Cisco Systems, Inc., Proteon, Inc. and SynOptics Communications, Inc. "This new release will help users better manage their multivendor nets by allowing network managers to monitor both LAN and WAN devices on one platform and identify and resolve network problems faster," said Jeff Kaplan, director at Ledgeway/Dataquest, a consultancy in Framingham, Mass.

Ed Wiest, senior data communications manager at Executone Information Systems, Inc. in Darien, Conn., and a beta user of Release 4, said the company is using the new version to monitor and control all devices on its network, which consists primarily of point-to-point circuits between a data center and more than 50 sales offices.

"The new platform has greatly improved our network management performance by allowing us to process events almost 50% more quickly," he said. "It's also simplified the tests we commonly run, such as checking the status of a modem."

Currently, the company is not using the SNMP capabilities of Release 4. Those capabilities are provided by the 9800/SNMP, a stand-alone Transmission Control Protocol/Internet Protocol-compatible device that translates management data from SNMP-compliant equipment and feeds into the 9800 NMS. Based on an Intel Corp. 80386 processor, the 9800/SNMP can be linked directly to an Ethernet and tied to the 9800 via two RS-232 connections.

The 9800/SNMP takes the SNMP syntax of LAN devices and converts it into an asynchronous data stream. The NMS, an Open Systems Interconnection-based management system, converts data into the Common Management Information Protocol, an OSI net management standard.

A scripting feature can be used to create programs that include custom responses to specific traps issued by the devices. For example, a script can be written to instruct a router to retransmit over a secondary path if an alert received from the device router indicates a wide-area link is down.

Pricing for the 9800/SNMP is $10,000 to $25,000, depending on configuration. It is available now.

CLI monitoring

Also included in the 9800 is a new Command Line Interface (CLI), a software option that supports remote access to 9800 management functions via asynchronous terminals or personal computers.

Executone's Wiest said the CLI enables him to monitor the network even while he is off-site through use of a laptop or personal computer from home.

"Two people run this network, which consists of over 1,000 users in the field, so it's critical that both of us have access to the 9800 even when we're not physically here," Wiest said. "The CLI lets us remotely monitor, diagnose and troubleshoot problems."

DEC offers array of products

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ware components: the CIT Server and the CIT Applications Interface.

The server software runs on a hardware platform that DEC calls a CIT server, which provides a functional link between the switch and the VAX.

The server hardware can be either the diskless, single-port CIT Server 100 or the diskless, four-port CIT Server 500. Both offer a single Ethernet connection.

The CIT Applications Interface is incorporated by developers into voice/data applications. The CIT Server 100 hardware and software ranges in price from $11,500 to $21,500 and will be available next month.

DEC also announced two new features supported by its CIT Applications Interface. The first, Call Routing, enables a CIT application to use data, such as a caller's telephone number, to send telephone calls to specific ACD agents or to queues. The CIT Applications Interface also supports a predictive dialing feature that enables an application to automatically dial calls, freeing up agents' time.

The CallCenterPlus package also includes MultiLine DECVoice, DEC's previously announced hardware and third-party software that enables VAXes to support voice mail and voice response applications.

The existing DECVoice T-1 Telephony Board enables users to terminate three T-1 links into a VAX. It demultiplexes the T-1 signals into as many as 72 calls and sends them across the Q-bus to Multiline DECVoice boards, each of which supports as many as eight calls.

The MultiLine DECVoice option module and DECVoice T1 Telephony module are priced together at $9,410.

Under CallCenterPlus, DEC is offering Perception Technology Corp.'s voice response unit for VAXes and PDP-11s.

DEC will also provide a voice messaging system, developed by VoiceSoft Corp., which enables callers to leave messages while waiting to speak with agents. In addition, VoiceSoft has an API — a set of routines that developers use to build customized PBX/VAX applications.

Initial licenses for VoiceSoft's VOICEMail and VOICEapi range in price from $10,000 to $180,000.

DEC will also offer Computer Automation, Inc.'s Q/FAX board for the DEC MicroVAX. The board can simultaneously support as many as 31 facsimile lines.

DEC also announced that its CIT software supports the European Computer Manufacturers Association's Computer-Supported Telephony Applications specification, an emerging European PBX-to-host standard, but does not yet support ANSI's Switch-Computer Applications Interface.

IBM unveils bevy of components

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Novell server."

Both products include mainframe and server software. The NetWare server portion requires an IBM Personal System/2 Model 8570 or above with 70M bytes of fixed disk and 4M bytes of random-access memory.

LANRES/VM will be available in December, and the MVS version will be available in March 1992. Single-copy charges for both versions range in price from $7,090 to $247,200, while monthly license fees range from $148 to $5,150.

IBM also last week announced a new, slimmed-down, less expensive version of its OS/2 TCP/IP software.

Version 1.2 of IBM's TCP/IP for OS/2, which now works with OS/2 Standard Edition as well as Extended Edition, is offered in a $200 base version that supports such TCP/IP basics as the File Transfer Protocol (FTP) and the Telnet virtual terminal protocol.

Optional packages that offer support for X.25, Network File System (NFS), X Window System and a programmer's tool kit can be bought separately. A total package with all options costs $650. That's $150 less than the original TCP/IP Version 1.1 for OS/2 Extended Edition, which IBM last week said has been taken off the market.

Version 1.2 includes new functions, such as support for NFS, which lets users share files with each other, and the graphics capabilities of the X Window System Server.

IBM also announced a new version of its TCP/IP for DOS software. It supports more Telnet clients, the FTP server function — which enables users to extract data from the DOS machine — and the NFS client. The latter lets DOS users access and manipulate files on remote machines that support the FTP server function.

Scheduled for availability next month, TCP/IP Version 2 for DOS has a base charge of $200. NFS support costs an additional $125.

IBM also last week provided more details on its commitment to support the DCE.

IBM said it will first address MVS/ESA, OS/2 and AIX with support of the DCE remote procedure call, directory, security and time interfaces. IBM said it would offer a suite of DCE products in a future release of AIX for the RISC System/6000 and for the new AIX/ESA, a version of AIX announced last week for the System/390 mainframes that will be built on the OSF's OSF/1 operating system.

Also last week, IBM fulfilled a statement of direction to support frame relay and Ethernet networks on its front-end processors with the announcement of a new version of its Network Control Program that supports those features. The new version is due out in September 1992.

Gandalf airs T-1 mux line

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Additionally, in the second quarter of next year, Gandalf plans to introduce frame relay support across the Infotron 2000 line. Frame relay is an emerging packet technology that reduces network delay by stripping off many error correction protocols.

Gandalf will also offer some form of LAN routing on each of the three multiplexers to support routing of Ethernet and token-ring data.

Gandalf is considering adding protocol translation, voice switching and support for the High Speed Serial Interface standard to the Infotron 2000 line in 1993, Luczak said.

Entry-level pricing for the Infotron 2000 is $50,000, while fully configured models cost as much as $500,000.

Pricing for the 2300 ranges from $14,000 to $18,000, depending on configuration, while the 2120 costs $5,000 for a data-only configuration and $11,000 for data, video and voice support.

FCC meets on net outages

continued from page 6

search, a jointly owned research arm of the RBHCs, agreed to develop a draft proposal on network testing and interconnection for the industry.

Sikes said he intends to put the issue of network reliability at the top of the agenda during a scheduled meeting with state regulators next month. In his letter inviting industry representatives to the meeting, Sikes said the agency will do whatever is necessary to make sure that public policy keeps pace with the introduction of new network technology.

Some attendees expressed disappointment that most of the discussion was centered on handling outages after they occur rather than attempting to prevent them.

"Will the commission merely facilitate occasional industry discussions after the fact or apply the pressure of government to ensure that progress is made on improving service quality?" asked ICA Counsel Brian Moir.

He urged the FCC to step up efforts to collect and review carrier data on their internal network standards and performance. "The more limited the commission's information, the more ineffective its monitoring of the industry will be," Moir said.

Product blitz widens horizons

continued from page 1

work identifies a set of products that will enable end users to transparently access and manipulate data housed on personal computers, local-area networks, minicomputers and mainframes.

The announcement, which also included news of major enhancements to IBM's core relational data base management systems, drew support from nine major DBMS providers, including Computer Associates International, Inc., Novell, Inc. and Oracle Corp.

Providing distributed data base capabilities is a key concern for IBM in order to provide for interoperability among its diverse hardware platforms and to flesh out its client/server computing vision.

PHOTO ©1991 DANILLE SWICK

Earl Wheeler

"What we're aiming for is a set of interchangeable tools within one controllable and consistent framework," said Earl Wheeler, IBM's senior vice-president and general manager of programming systems. "Our goal is to create an environment where end users don't have to know where data is, nor do they need to care. All they must do is request it."

Shaku Atre, president of Atre/Intec, Inc., a Rye, N.Y., consultancy, said Information Warehouse is "an extension of the SAA concept in that it includes platforms from other vendors."

She said it doesn't yet provide all that is needed for true distributed data base capabilities "but with the joint partnerships, they have taken a shortcut to get there.

"IBM takes very long to develop products, and they probably don't have the expertise needed to go to other platforms," Atre said. "This is good for users because IBM will be getting the expertise from its business partners."

Three components

IBM's framework has three major elements: Decision Support, Data Delivery and Enterprise Data.

The Decision Support component includes applications that enable users to retrieve, analyze, interpret, manipulate and present data obtained from anywhere in an enterprise.

IBM tools in this category include the Query Management Facility, IBM Application System, Lotus Development Corp.'s 1-2-3/M, SAA LanguageAccess, Data Extract, IBM Data Interpretation System, Personal Application Systems and Executive Decisions.

These products are primarily used to access information in IBM DBMSs, although Big Blue said it intends to announce future enhancements to its Decision Support products to enable them to access additional data bases.

The Data Delivery element of the framework defines how information will be moved transparently from a data base to a user who requests it. It is based on IBM's Distributed Relational Database Architecture (DRDA), which is IBM's plan for enabling SQL data bases to share information.

Last week, nine major players pledged to make their products compatible with DRDA: Borland International, Inc., Computer Associates, GUPTA Technologies, Inc., Informix Software, Inc., Locus Computing Corp., Micro Decisionware, Novell, Oracle and Sybase, Inc.

Also under the Data Delivery component, IBM highlighted an existing software product from Information Builders, Inc. (IBI), a member of IBM's newly announced International Alliance, an organization of software vendors committed to supporting the Information Warehouse framework.

IBI's Enterprise Data Access (EDA)/SQL provides end-user access to data residing on relational data bases, as well as non-relational data bases. It comprises four components running on the workstation and host that translate an SQL query from an application for processing by a target DBMS. It delivers the requested information from the DBMS in a format familiar to the user.

> "Our goal is to create an environment where end users don't have to know where data is, nor do they need to care."
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EDA/SQL can work with more than 35 computers and more than 50 different file formats, according to IBI.

The product is available immediately for the MVS environment and support for other platforms expected by the end of the year.

The final component of the framework is the Enterprise Data concept, which covers the core DBMSs and data used in an enterprise, as well as tools for ensuring the integrity, security, recovery and reliability of all data.

Under the Enterprise Data rubric, IBM announced distributed access enhancements to its DB2 and SQL/DS relational DBMSs.

IBM has added remote-unit-of-work (RUOW) distributed DBMS functions to DB2 Version 2 Release 3, which enables the system to access data on SQL/DS Version 3 Release 3, running on VM mainframes; the data base manager portion of OS/400 Version 2 Release 1; other DRDA-compatible systems; as well as other DB2 systems.

The new DB2 will be able to access the OS/2 data base manager only as an RUOW client, however. The enhanced version of DB2 will be fully available in March 1992.

The company also enhanced SQL/DS with RUOW to enable it to access DB2, OS/400 data base manager, other systems that implement DRDA as well as other SQL/DS systems.

SQL/DS will also be able to access the OS/2 data base manager only as an RUOW client.

The enhanced version of SQL/DS will be available in May 1992.

NETWORK WORLD

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161 Worcester Road
Framingham, Mass. 01701-9172
(508) 875-6400

Second-class postage paid at Framingham, Mass., and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-820-7444.

Non-qualified subscribers: $5.00 a copy; U.S. — $95 a year; Canada, Central & South America — $110 a year; Europe — $165 a year, all other countries — $245 a year (air-mail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label from front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor, Mich. 48106.

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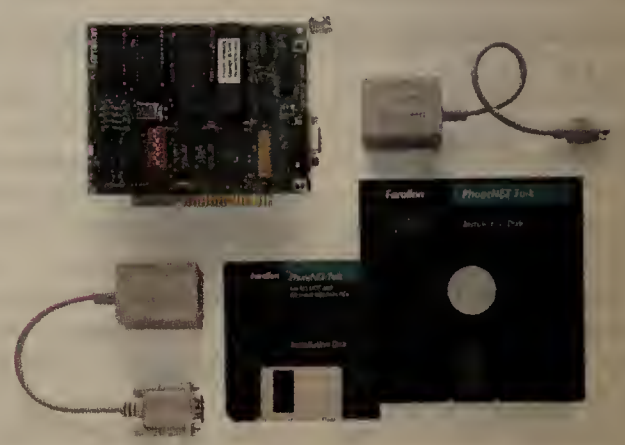

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